H10919

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. RA-10-16-99

Registry No. H-10919

LOCALITY

State Alaska

General Locality Southwest Prince William Sound

Sublocality Port Chalmers

1999

CHIEF OF PARTY
Commander D.R. Herlihy

LIBRARY & ARCHIVES

DATE March 8, 2002

NOAA FORM 77-28 (11-72)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

REGISTER NO.

HYDROGRAPHIC TITLE SHEET

H-10919

INSTRUCTIONS - The hydrographic sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the office.

FIELD NO.
RA-10-16-99

State: Alaska

General Locality: Southwest Prrince William Sound

Sublocality: Port Chalmers

Scale: 1:10,000 Date of Survey: 08/12/1999 -- 10/11/1999

Instructions Date: 07/30/1999 Project No.: OPR-P139-RA-99

Vessel: RA-1(2121), RA-2(2122), RA-3(2123), RA-4(2124), RA-5(2125), RA-6(2126)

Chief of Party: Commander D.R. Herlihy, NOAA

Surveyed by: RAINIER Personnel

Soundings taken by echo sounder: DSF6000N, KNUDSEN 320M, RESON 8101 MB

Graphic record scaled by: RAINIER PERSONNEL

Graphic record checked by: RAINIER PERSONNEL

Evaluation by: K. Sampadian Automated plot by: HP Designjet 1050C

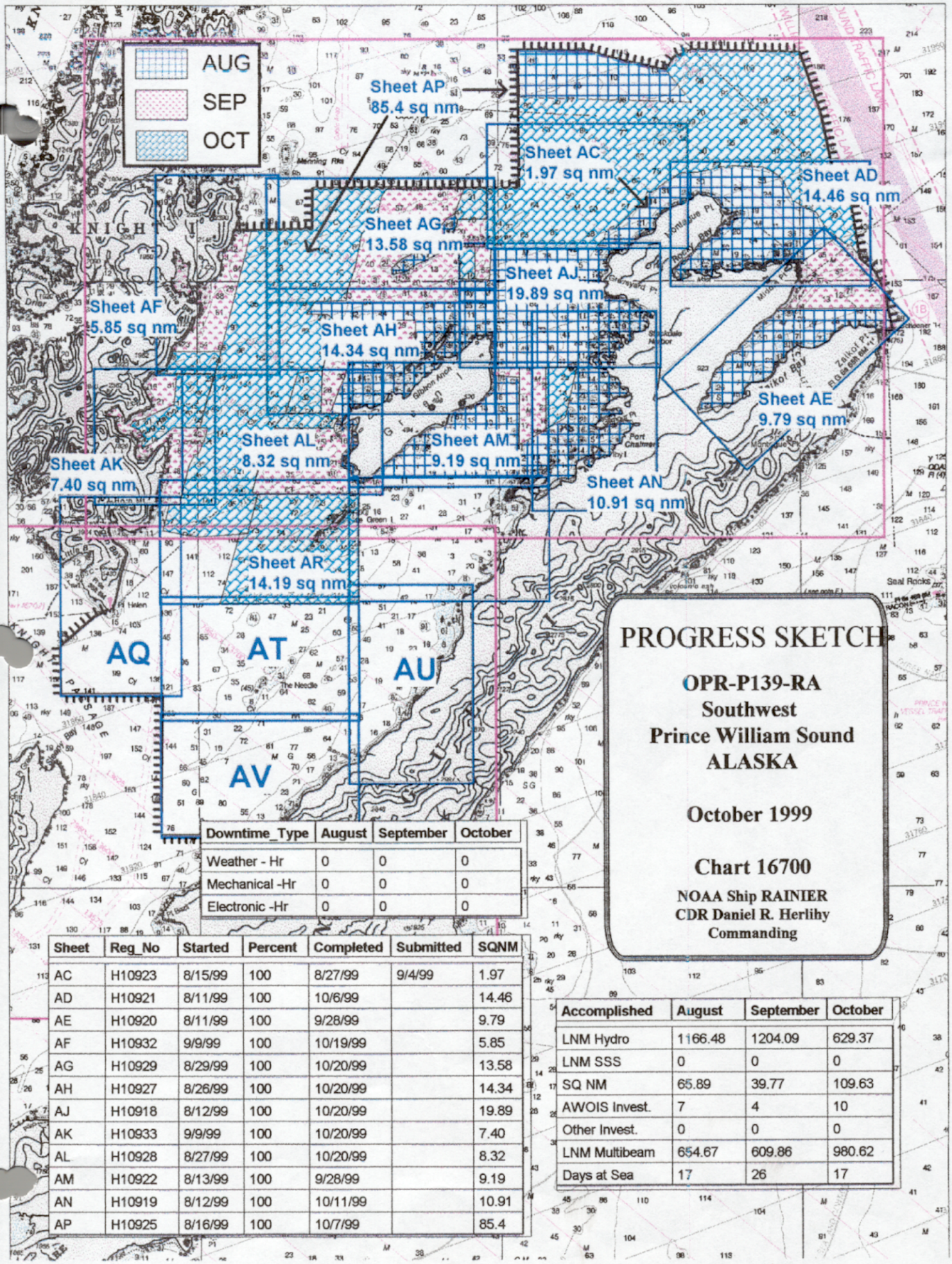
Verification by: K. Sampadian

Soundings in: Fathoms and fractions at MLLW

REMARKS: Time in UTC. Revisions and marginal notes in black were generated during office processing. All separates are filed with the hydrographic data. As a result page numbering may be interrupted or non-sequential.

4wois/ SURF 02/13/02
MCR

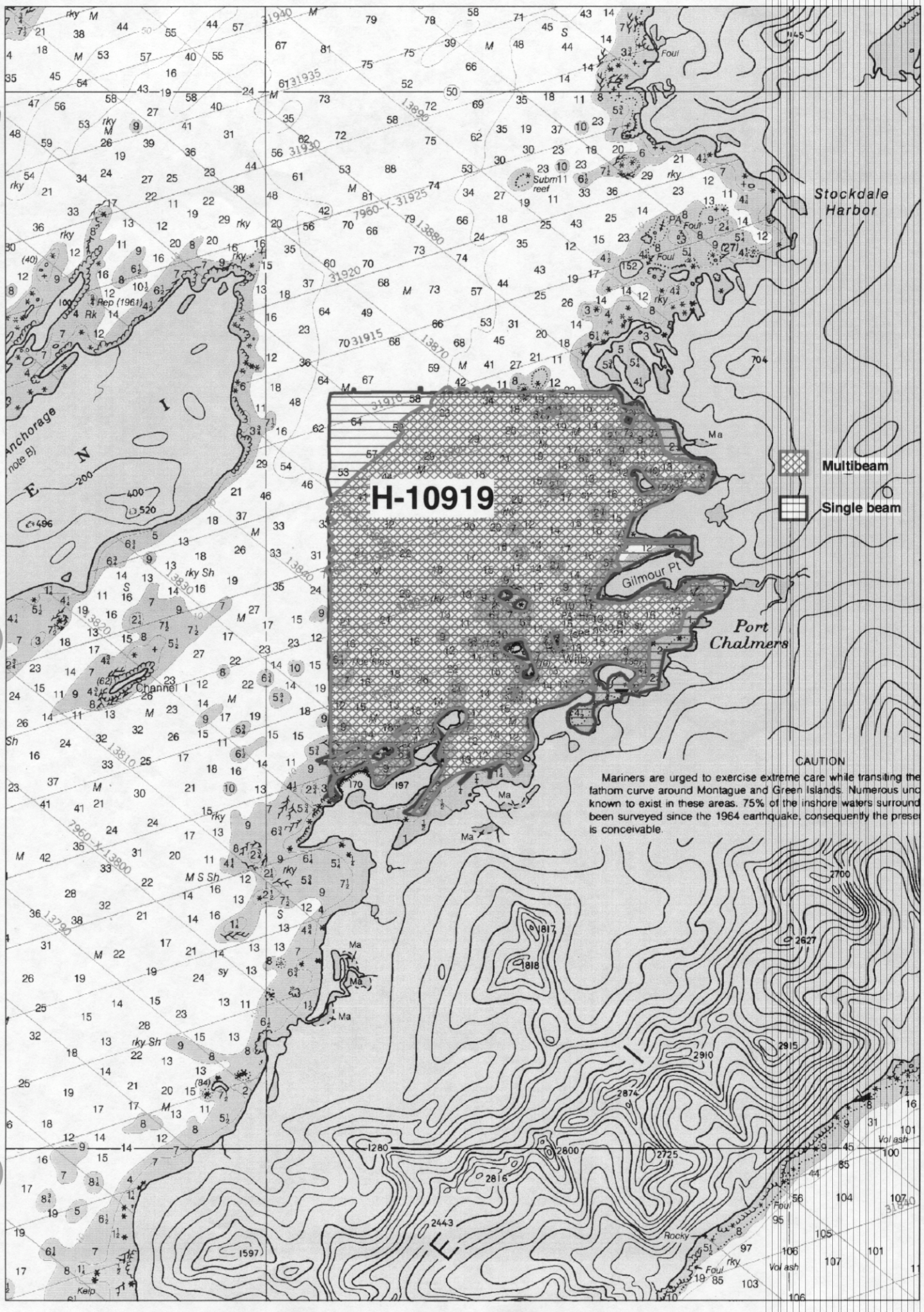
All depths listed in this report are referenced to mean lower low water unless otherwise noted.



Downtime_Type	August	September	October
Weather - Hr	0	0	0
Mechanical -Hr	0	0	0
Electronic -Hr	0	0	0

Sheet	Reg_No	Started	Percent	Completed	Submitted	SQNM
AC	H10923	8/15/99	100	8/27/99	9/4/99	1.97
AD	H10921	8/11/99	100	10/6/99		14.46
AE	H10920	8/11/99	100	9/28/99		9.79
AF	H10932	9/9/99	100	10/19/99		5.85
AG	H10929	8/29/99	100	10/20/99		13.58
AH	H10927	8/26/99	100	10/20/99		14.34
AJ	H10918	8/12/99	100	10/20/99		19.89
AK	H10933	9/9/99	100	10/20/99		7.40
AL	H10928	8/27/99	100	10/20/99		8.32
AM	H10922	8/13/99	100	9/28/99		9.19
AN	H10919	8/12/99	100	10/11/99		10.91
AP	H10925	8/16/99	100	10/7/99		85.4

Accomplished	August	September	October
LNM Hydro	1166.48	1204.09	629.37
LNM SSS	0	0	0
SQ NM	65.89	39.77	109.63
AWOIS Invest.	7	4	10
Other Invest.	0	0	0
LNM Multibeam	654.67	609.86	980.62
Days at Sea	17	26	17


H-10919
Multibeam
Single beam
Stockdale Harbor
Port Chalmers
Gilmour Pt
Anchorage
Channel
Foul
Rocky
Kelp
Vol ash
CAUTION
Mariners are urged to exercise extreme care while transiting the
fathom curve around Montague and Green Islands. Numerous und
known to exist in these areas. 75% of the inshore waters surround
been surveyed since the 1964 earthquake, consequently the preser
is conceivable.

Descriptive Report to Accompany Hydrographic Survey H10919

Field Number RA-10-16-99

Scale 1:10,000

November 1999

NOAA Ship RAINIER

Chief of Party: CDR Daniel R. Herlihy, NOAA

A. PROJECT

This basic hydrographic survey was completed as specified by Hydrographic Survey Letter Instructions OPR-P139-RA, dated July ~~20~~ 30, 1999, and the Draft Standing Project Instructions dated April 6, 1999. Survey H10919 corresponds to Sheet AN (Sheet 11 in HPS) as defined in the sheet layout. This survey will provide data to supersede prior surveys conducted in the early to mid 1900s and will affect Charts 16700, 16701, and 16709. Requests for hydrographic surveys and updated charts in this area have been received from the National Imagery and Mapping Agency (NIMA), the U.S. Coast Guard, the Southwest Alaska Pilot's Association, cruise ship lines, and local fishermen. ✓

Significant changes in depths and shoreline may have occurred in the project area as a result of the earthquake of March 27, 1964. ✓

B. AREA SURVEYED (SEE EVAL. REPORT, SECTION B)

The survey area is the vicinity of Port Chalmers, located on the west side of Montague Island in Southwest Prince William Sound, Alaska. The survey's northern limit is latitude 60°17'10"N and the southern limit is latitude 60°~~12'27~~ 13'10"N. The revised survey's western limit is longitude 147°18'~~45~~ 47"W, and the eastern limit is the shoreline at approximate longitude 147°~~10'29~~ 11'09"W (Figure 1). Data acquisition was conducted from August 12 to October 11, 1999 (DN 224 to 284). ✓

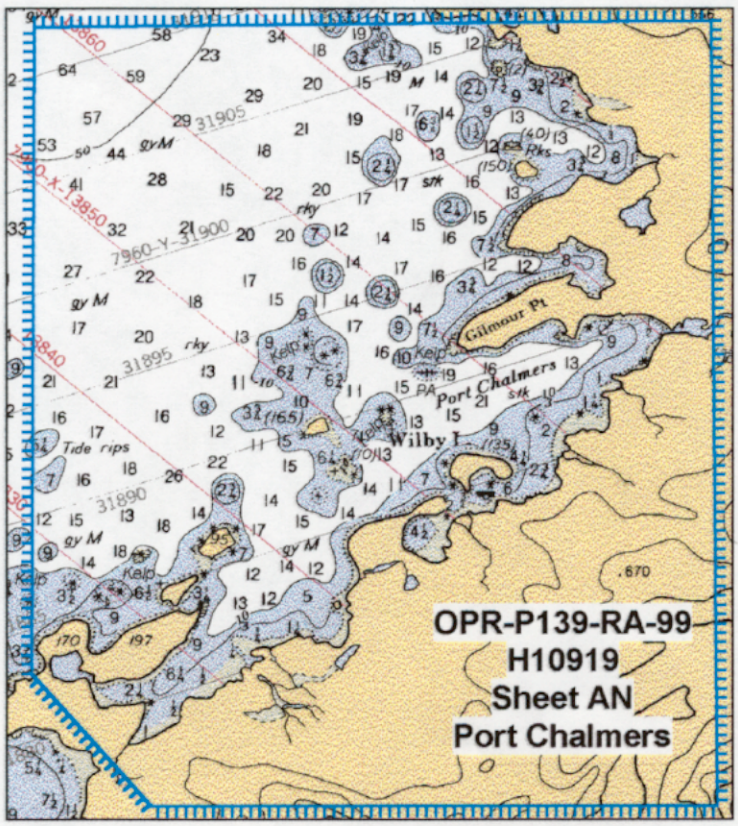


Figure 1. Survey Area for OPR-P139-RA-99

C. SURVEY VESSELS

Data were acquired by RAINIER's survey launches (vessel numbers 2121, 2122, 2123, 2124, 2125, and 2126) as noted in the Survey Information Summary included with this report. Vessels 2121 and 2126 were used exclusively for acquisition of shallow-water multibeam data. Vessels 2122, 2124, and 2125 were used for acquisition of vertical beam data and the latter was used to collect bottom samples as well. Vessel 2123 was used to collect both shallow-water multibeam and vertical beam data. See Project Related Data for OPR-P139-RA-99 for vessel descriptions.* No unusual vessel configurations or problems were encountered on this survey. ✓ CONCUR

D. AUTOMATED DATA ACQUISITION AND PROCESSING (SEE EVAL. REPORT, SECTION D)

All vertical beam echo sounder (VBES) data were acquired using Coastal Oceanographic's HYPACK version 8.9 and processed with the Hydrographic Processing System (HPS) version 9.3 and MapInfo 5.0. Final detached positions, features, and soundings based on unverified observed tides were saved in MapInfo format. ✓

Shallow water multibeam (SWMB) echosounder data were acquired using Triton-Elics' ISIS software version 4.32 and processed using Universal Systems Limited's CARIS HIPS software version 4.3. ✓

Shallow-water multibeam data were reviewed with the CARIS Hydrographic Data Cleaning System (HDCS). Depth fliers were identified and manually flagged as "rejected". Vessel positioning and attitude data from each system were similarly displayed and manually cleaned. Additionally, instantaneous speed as computed from the positioning data was checked for speed jumps exceeding 3 knots as an indication of potential position fliers. For this survey, all mainscheme soundings beyond a maximum angle of 60° off nadir and all development soundings beyond a maximum angle of 45° were rejected in accordance with Project Instructions. ✓

After review and cleaning, depth, position and attitude data were merged with sound velocity, unverified observed tide and dynamic draft correctors to compute the corrected depth and position of each sounding. Processed soundings were read into a CARIS Workfile by selecting shoal-biased "line-by-line" binning at a two densities; one at 3m x 3m, the other at 1.5mm x 1.5mm at survey scale. The former was used to create digital terrain models (DTMs) which were used to demonstrate multibeam coverage and perform multibeam quality-assurance, while the latter was used to export soundings into HPS through HPTools. Unverified observed tides were applied in the Hydrographic Processing System (HPS) and the processed soundings were excessed using a 3mm character size, and plotted at a 2 mm character size to produce the final sounding plot. Final selected soundings were saved and plotted in MapInfo. Raster images registered in MapInfo facilitated chart and prior survey comparisons. ✓

Survey H10919 is defined as sheet **11** in HPS. The CARIS workfile name for the 5m x 5m DTM is defined as **h10919_5m**; the CARIS workfile name for the soundings exported at 1.5mm at the scale of the survey is defined as **h10919_15m**; the CARIS workfile name for the QC report is **h10919_qc**; and the project name is identified as **P139_SheetAN** in HDCS. ✓

All final plots were created in MapInfo using UTM Zone 6 projection. ✓

A complete listing of software is included in Appendix H. A data flow diagram is included in Appendix G. ✓ *

* FILED WITH HYDROGRAPHIC DATA

E. SONAR EQUIPMENT

Side Scan Sonar (SSS) equipment was not used on this survey. However, it should be noted that the Reson SeaBat 8101 SWMB system provides a low-resolution digital SSS record of the SWMB swath. This SSS imagery is primarily used during final processing of SWMB depth data to aid in determining whether anomalous soundings are true features or noise. ✓ CONCUR

F. SOUNDING EQUIPMENT

Two different categories of echosounder systems were used and are described below. The individual system(s) chosen for use in a given area were decided at the discretion of the Hydrographer using the guidance stated in the Project Instructions, and depended upon the limitations of each system, bottom topography, water-depth, and the ability of the platform vessel to safely navigate the area. ✓

1. Launch Vertical Beam Echo Sounder (VN 2122, 2123, 2124, 2125) ✓

The vertical beam echo sounders (VBES) utilized for this survey were the Raytheon DSF-6000N (VN 2122, 2124, 2125) and Knudsen 320M (VN2123), which are dual frequency (100 kHz, 24 kHz), digital recording singlebeam fathometers with analog paper records. Soundings were acquired in meters for both frequencies, and high frequency was utilized as the primary frequency. VBES serial numbers are included in Appendix H.*

VBES data were also acquired concurrently with SWMB data and were compared to nadir beams of the shallow-water multibeam in real time during data acquisition to assure SWMB data quality. In addition, digital VBES depth data are used by Isis to assist the Reson 8101 in tracking the bottom. The latter is extremely helpful in areas of extreme relief, when the shallow-water multibeam tends to lose bottom lock. VBES mainscheme lines spaced 100 meters apart were completed within the entire survey area to establish preliminary depths. Lines offset by 50 meters from the mainscheme lines were performed in areas too shallow for the SWMB and in areas with eelgrass, which prevented good sonar return in SWMB (Figure 2).

VBES data acquired during SWMB acquisition were not used for final sounding plot compilation, and are not included with the digital survey data. ✓

2. Launch Shallow Water Multibeam (SWMB) (VN 2121, 2123, 2126) ✓

The shallow-water multibeam (SWMB) system utilized for this survey was the Reson SeaBat 8101, which is a 240 kHz multibeam system that measures relative water depths across a wide swath perpendicular to the vessel's heading. The Reson 8101 has a 150° swath, consisting of 101 individual 1.5° x 1.5° beams. A TSS POS/MV Position and Orientation Sensor was used to correct for the effects of vessel motion during survey operations. Serial numbers for the Reson 8101 and POS/MV are included in Appendix H.*

SWMB was used to develop shoal areas and acquire least depths over significant features identified during VBES data acquisition. In addition, multibeam coverage was obtained in areas greater than 5 meters and less than 80 meters in depths (Figure 3). ✓

* FILED WITH HYDROGRAPHIC DATA

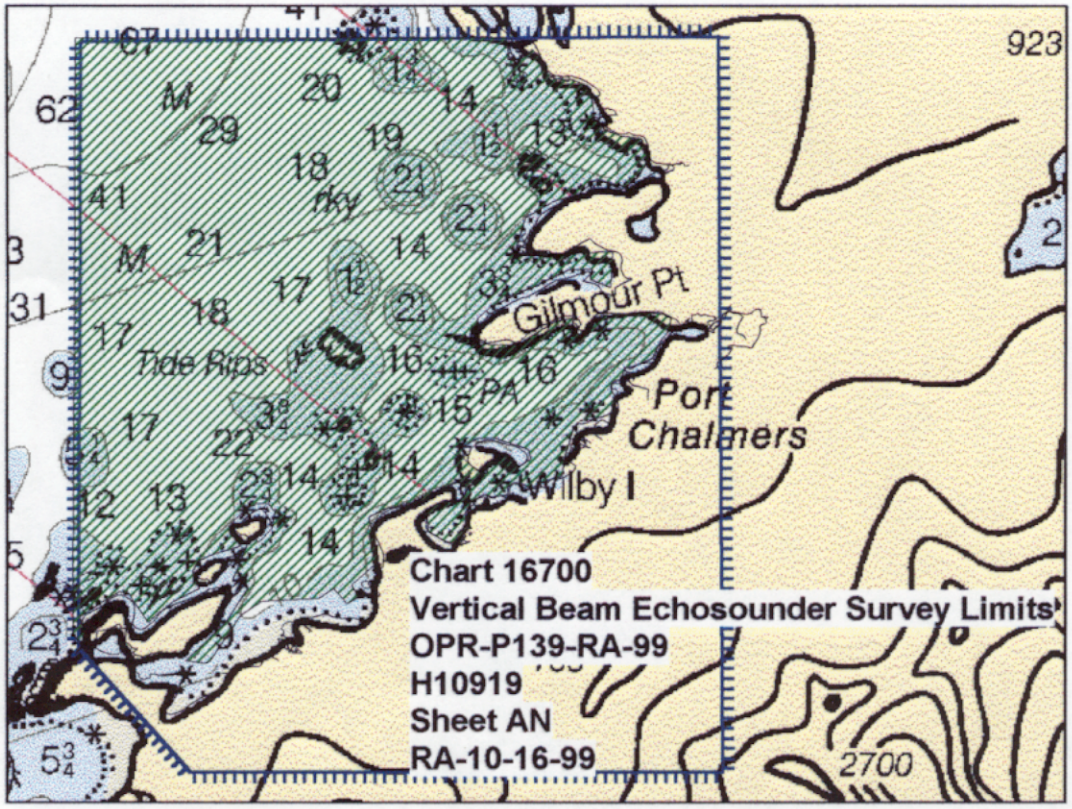


Figure 2. Vertical Beam Echosounder Survey Limits

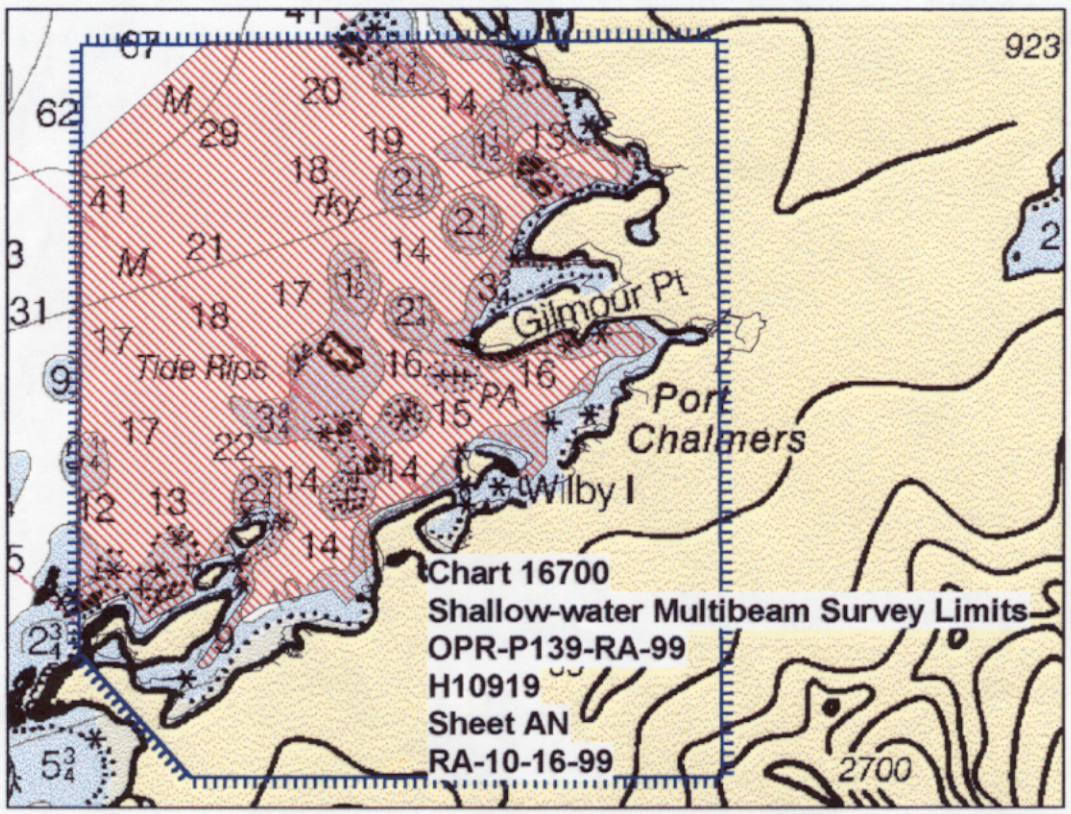


Figure 3. Shallow-water Multibeam Survey Limits

G. CORRECTIONS TO ECHO SOUNDINGS (SEE EVAL. REPORT, SECTION G)

Water Level Correctors

Soundings were reduced to Mean Lower-Low Water (MLLW) using unverified tide data for station Cordova, AK (945-4050) obtained from the Center for Operational Oceanographic Products and Services (CO-OPS) web site. These data were used in creating HPS tide table #1 and were also used in CARIS. ✓

Listings of HPS tide tables used for H10919 and tidal correctors as provided in the Project Instructions for H10919 are provided in the Survey Information Summary included with this report. ✓ NOT INCLUDED

The operating National Water Level Observation Network (NWLON) primary tide stations at Cordova, Alaska (945-4050) and Valdez, Alaska (945-4240) will serve as control for datum determination at four subordinate stations. Because a Next Generation Water Level Measurement System (NGWLMS) Aquatrak sensor is the only sensor installed at these primary stations, RAINIER personnel were neither required nor able to inspect and perform leveling at these stations. ✓

RAINIER personnel installed Sutron 8200 "bubbler" tide gauges (Table 1) at the following subordinate stations:

Table 1. Tide Gauges installed for OPR-P139-RA-99

Station Name	Station Number	Type of Gauge	Date of Installation	Date of Removal
Zaikof Point	945-4411	30-day	10 August 1999	14 October 1999
Port Chalmers	945-4511	30-day	10 August 1999	20 October 1999
Snug Harbor	945-4662	30-day	11 August 1999	20 October 1999
Montague Island	945-4616	30-day	31 August 1999	20 October 1999

Refer to the Field Tide Notes and supporting data in Appendix D for individual gauge performance and level closure information. *

Raw water level data from these gauges was forwarded to N/OPS1 throughout the project period, with the final package submitted on October 29, 1999 in accordance with HSG 50 and FPM 4.7. The Pacific Hydrographic Branch will apply final approved (smooth) tides to the survey data during final processing. A request for delivery of final approved (smooth) tides to the Pacific Hydrographic Branch was forwarded to N/OPS1 on October 30, 1999 in accordance with FPM 4.8. * APPROVED TIDE NOTE DATED MAY 15, 2000 IS ATTACHED

Sound Velocity Correctors

The velocity of sound through water was determined by a minimum of one cast every four hours of acquisition in accordance with the Draft Standing Project Instructions. Cast information is included in the Survey Information Summary and in Appendix I. ATTACHED

The sound velocity casts were acquired with SBE SEACAT Profilers (S/N 2543, 2044 and 219). Calibration reports and dates are included with the project data for OPR-P139-RA-99.* Velocity correctors were computed using the program VELOCWIN version 4 beta 2, which generates correction tables for both CARIS and HPS. For singlebeam launches, sound velocity correctors were applied to the raw sounding data in HPS during post-acquisition processing. For SWMB launches, sound velocity correctors were applied in CARIS during post-acquisition processing. ✓

* FILED WITH HYDROGRAPHIC DATA

Settlement and Squat Correctors

The following table shows when the vessel offset correctors used for this survey were determined:

Vessel No.	Date of Static Draft and Transducer Offset Measurements	Method of Settlement and Squat Measurement	Date of Settlement and Squat Measurement	Location of Settlement and Squat Measurement
2121	March 1999	OTF	March 1999	Port Angeles, WA
2122	March 1999	Rod leveling	March 1999	Port Angeles, WA
2123	March 1999	OTF	March 1999	Port Angeles, WA
2124	March 1999	Rod leveling	March 1999	Port Angeles, WA
2125	March 1999	Rod leveling	March 1999	Port Angeles, WA
2126	March 1999	OTF	March 1999	Port Angeles, WA

Settlement and squat correctors, static draft measurements and vessel offsets are included with the Project Related Data for OPR-P139-RA-99.* ✓

Heave, Pitch, Roll Biases and Heading, including Biases and Navigation Timing Errors

SWMB launches (VN 2121, 2123, and 2126) utilize a TSS POS/MV Model 320 Position and Orientation System (POS), which provides accurate navigation and attitude data to correct for the effects of heave, pitch, roll and heading. The POS generates attitude data in three axes (roll, pitch and heading) to an accuracy of 0.05° or better. Heave measurements supplied by the POS maintain an accuracy of 5% of the measured vertical displacement for movements that have a period of up to 10 seconds. The POS delivers heading measurements by two distinct methods. First, the Dynamic Heading Alignment determines the vessels heading by using the data supplied by the Internal Measurement Unit (IMU) and GPS receivers to achieve heading that is, at best, accurate to within 0.35°. This method suffers from drift but is relatively unaffected by noise. Second, the GPS Azimuth Measurement System (GAMS) determines the geographic vector between two GPS antennas fixed to the vessel by comparing the phase of satellite signals they receive. The error from this method is largely due to noise, but exhibits no drift. The POS uses the advantages of each method to compensate for the disadvantages of the other to arrive at an optimal accuracy of 0.05°. Serial numbers are located in Appendix H.* ✓

Heave, roll, pitch, and navigation latency biases were determined during Patch Tests conducted at Port Angeles, WA on March 26-28, 1999 for vessels 2126 and 2123, and at Shilshole, WA, on July 7, 1999 for vessel 2121. SWMB vessel offsets, dynamic draft correctors, and system bias values are contained in CARIS Vessel Configuration Files (VCF's) and were created using the program "VCFEDIT" in CARIS. These offsets and biases are applied to the sounding data during processing in CARIS. A printout of each VCF is contained in the Project Related Data for OPR-P139-RA-99,* and the VCF's themselves are included with the digital HDCS data. ✓

H. HYDROGRAPHIC POSITION CONTROL (SEE EVAL. REPORT, SECTION H & I)

The horizontal datum for this project is NAD 83. Differential GPS was the sole method of positioning. The US Coast Guard Beacons at Cape Hinchinbrook (ID# 894) and Potato Point (ID# 883) were the sources of differential correctors.

Launch-to-launch DGPS performance checks were performed in accordance with Section 3.2 of the FPM. A list of system checks performed during this survey is contained in Section F. Copies of the performance checks are included in the Project Related Data for OPR-P139-RA-99.*

* FILED WITH HYDROGRAPHIC DATA

I. SHORELINE (SEE EVAL. REPORT, SECTION 5)

Method of Shoreline Verification

N/NGS3 supplied photogrammetric shoreline in MapInfo format for T-12711, T12714, and T-12715 for use as source shoreline. The T-sheet shoreline was imported into Hypack for field verification. In addition, features shown on the current editions of charts 16700, 16701, and 16709 were digitized in MapInfo by RAINIER personnel and displayed in Hypack for field verification. ✓

Shoreline verification was conducted near predicted low water in accordance with the Project Instructions and FPM 6.1 and 6.2. For this survey the general limit of safe navigation of a survey launch was 5-30 meters offshore of apparent low tide. Water depths along this limit of safe navigation are generally 2-5 meters at Mean Lower Low Water (MLLW). Features unreachable by survey launch shown inshore of the Navigable Area Limit Line (NALL) are the hydrographer's approximate representation of the shoreline. ✓

Detached positions taken during shoreline verification were recorded within HYPACK and on DP forms, and processed in HPS. These indicate revisions to features, and features not found on the T-sheets or charts. ✓

A detailed DP and BS plot is provided showing all detached positions and bottom samples with notes relating to each feature. Updated shoreline and features are also depicted on the final sounding plot. ✓

Source Shoreline Changes and New Features

Several changes and new features* were found and are depicted on the final DP plot. T-sheet rocks and islets were often identified as high points of new ledges, reefs, or extents of islands or islets. Some T-sheet rocks were also represented on the charts (e.g., Pos. #20038, #20093, #20094). A few exceptions were found:

A new reef was found at the northern end of the survey area. The northern extent of the reef was found at 60°16'59.189"N 147°14'30.993"W (Pos. #25003); SE extent 60°16'56.915"N 147°14'28.255"W (Pos. #25001); and west extent 60°16'56.768"N 147°14'37.765"W (Pos. #25000). The Hydrographer recommends charting the reef as surveyed. CONCUR

A new reef was found at the southern end of the survey area. The northern extent of the reef was found at 60°14'21.610"N 147°16'18.974"W (DP# 20109) and the southern extent 60°14'20.653"N 147°16'20.545"W (Pos. #20110). The Hydrographer recommends charting the reef as surveyed. CONCUR

A T-sheet rock at 60°14'12.252"N 147°13'44.653"W was not found (Pos. #20655) after a 50-meter radius visual search conducted at low water for 15 minutes in depths of approximately 3 meters, water visibility approximately 2 meters. This rock also appears on Charts 16700, 16701, and 16709 (Pos. #20656). The Hydrographer recommends removing the T-sheet rock from all charts mentioned. CONCUR

A T-sheet rock at 60°13'47.216"N 147°16'42.619"W was not found (Pos. #50040) after a 50-meter radius visual search conducted at low water for 15 minutes in depths of approximately 3 meters, water visibility approximately 2 meters. The Hydrographer recommends removing the T-sheet rock. DO NOT CONCUR - T-SHEET ROCK RETAINED BASED ON COMMENTS ON THE DETACHED POSITIONS FORM.

Recommendations

The Hydrographer recommends that the shoreline as depicted on "H10919_DP and BS plot" and "H10919_Final Sounding plot" supersede and complement shoreline information compiled on the T-sheets as noted. These revisions are recorded in the MapInfo digital files named "H10919_Shoreline" and "H10919_Shoreline_Update". CONCUR WITH EXCEPTION TO THE ABOVE MENTIONED TS-ROCK.

* FOUR NEW ROCKS AND THE EXTENTS OF A NEW SUBMERGED REEF WERE FOUND BUT NOT DISCUSSED.

Charted Features

Charted rocks were identified as T-sheet rocks, reefs, islands, islets, high points, or extensions of T-sheet ledges except for the following exceptions:

(16701)
A charted rock at 60°13'58.137"N, 147°17'29.635"W was not found (Pos. #50204). Depths in the vicinity are approximately 8 meters, water visibility 2 meters. A 25-meter radius visual search was conducted at low water for 10 minutes. The Hydrographer believes that the charted rock is the T-sheet reef that is located approximately 30 meters east of the charted rock position. CONCUR

(16701)
A charted rock at 60°14'5.642N, 147°16'42.197"W was not found (Pos. #50211). Depths in the vicinity are approximately 5 meters, water visibility 2 meters. A 25-meter radius visual search was conducted at low water for 10 minutes. The Hydrographer believes that the charted rock is the T-sheet island that is located approximately 80m east of the charted rock position. The Hydrographer believes that this charted rock was moved further from the shoreline during chart compilation in an effort to both leave the high water shoreline unobscured and to better depict the reef at the scale of the chart. CONCUR

(16709)
A charted rock at 60°15'19.720"N, 147°12'0.364"W was not found (Pos. #51207). Depths in the vicinity are approximately 3m, water visibility 2m. A 25-m radius visual search was conducted at low water for 10 minutes. The Hydrographer believes that this charted rock may be the new rock found approximately 80m to the northeast (see Pos. #51206). The Hydrographer believes that this charted rock was moved further from the shoreline during chart compilation in an effort to both leave the high water shoreline unobscured and to better depict the rock at the scale of the chart. CONCUR W/CLARIFICATION - CHARTED ROCK IS TS ROCK NOT NEW ROCK

(16709)
A charted rock located at 60°15'46.475"N, 147°12'6.578"W (Pos. #51305) is incorrectly positioned on chart 16701. The Hydrographer believes that this charted rock is the T-sheet ledge located 50 meters to the north. The Hydrographer believes that this charted rock was moved further from the shoreline during chart compilation in an effort to both leave the high water shoreline unobscured and to better depict the rock at the scale of the chart. CONCUR

Recommendations

The charted shoreline should be revised using the T-sheet shoreline and fieldwork notes as recorded in the MapInfo digital files named "H10919_Shoreline" and "H10919_Shoreline_Update". AS SHOWN ON THE SMOOTHSHEET

J. CROSSLINES

VBES crosslines totaled 51.36 nautical miles, comprising 32.3% of mainscheme hydrography. Crosslines agreed within 1 meter of mainscheme hydrography.

SWMB crosslines totaled 21.6 nautical miles, comprising 6.67% of SWMB hydrography. The Quality Control Report (CARIS HIPS) for the checkline file averaged 80.15%, with a depth tolerance of 0.023. See Appendix E for the detailed report. *

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K. JUNCTIONS (SEE EVAL. REPORT, SECTION L)

There are two contemporary surveys that junction with H10919 as shown below and in Figure 4. ✓

Registry #	Sheet	Scale	Date	Junction Sides
H10918	AJ	1:10,000	1999	North side
H10922	AM	1:10,000	1999	West side

Soundings from H10922 compare well with this survey, agreeing within 1-2 meters. Data analysis for H10918 was not complete at the time of writing this report. A full discussion on this junction comparison will be part of the submitted Descriptive Report for H10918.

Final comparisons will be made at the Pacific Hydrographic Branch (PHB) after application of smooth tides. ✓

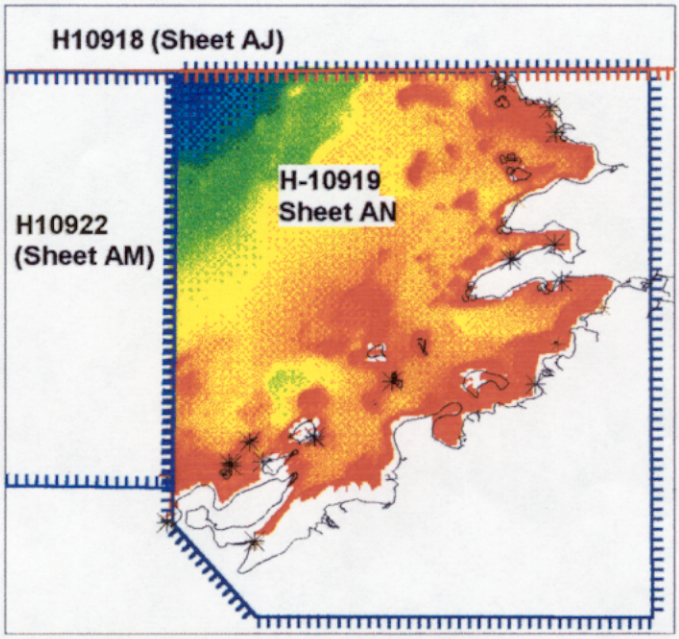


Figure 4. H10919 Junction Surveys

L. COMPARISON WITH PRIOR SURVEYS

One prior survey was conducted in the H10919 area as shown below and in Figure 5:

Registry #	Scale	Date	Junction side
H-5427	1:20,000	1933	Entire survey area

Prior survey H5427 covers the entire area of present survey H10919. The prior soundings were, for the most part, consistently ~~2-4~~ 1-3 fathoms deeper. An exception is in the southwest cove of the survey area. This cove was inaccessible by a survey launch due to shoalness of area. In the vicinity, average depths were ~~3-10~~ 2-5 fathoms shoaler than soundings from prior H5427. Similarly, the cove northeast of Port Chalmers was inaccessible by survey launches due to shoalness. CONCUR

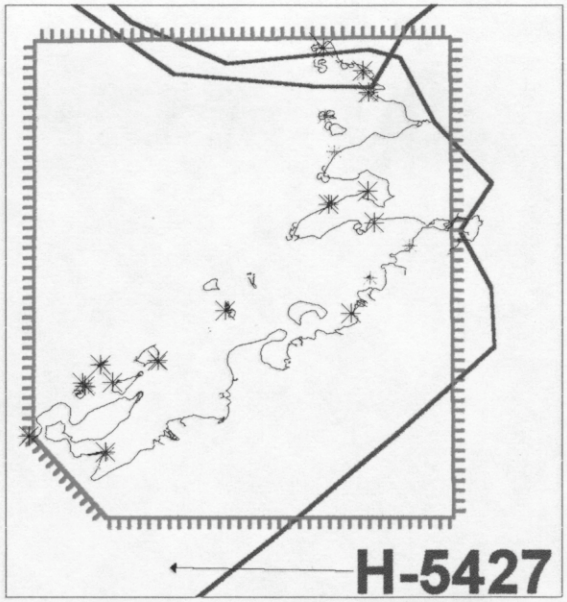


Figure 5. Prior survey covering H10919 survey area.

Differences between the current survey and prior surveys can probably be attributed to scale and improved modern positioning and sounding equipment, along with changes caused by the 1964 earthquake. Final comparisons will be made at the Pacific Hydrographic Branch after application of smooth tides. concur

M. ITEM INVESTIGATION REPORTS

There were two Automated Wreck and Obstruction Information System (AWOIS) items investigated within the survey area (Figure 6). concur

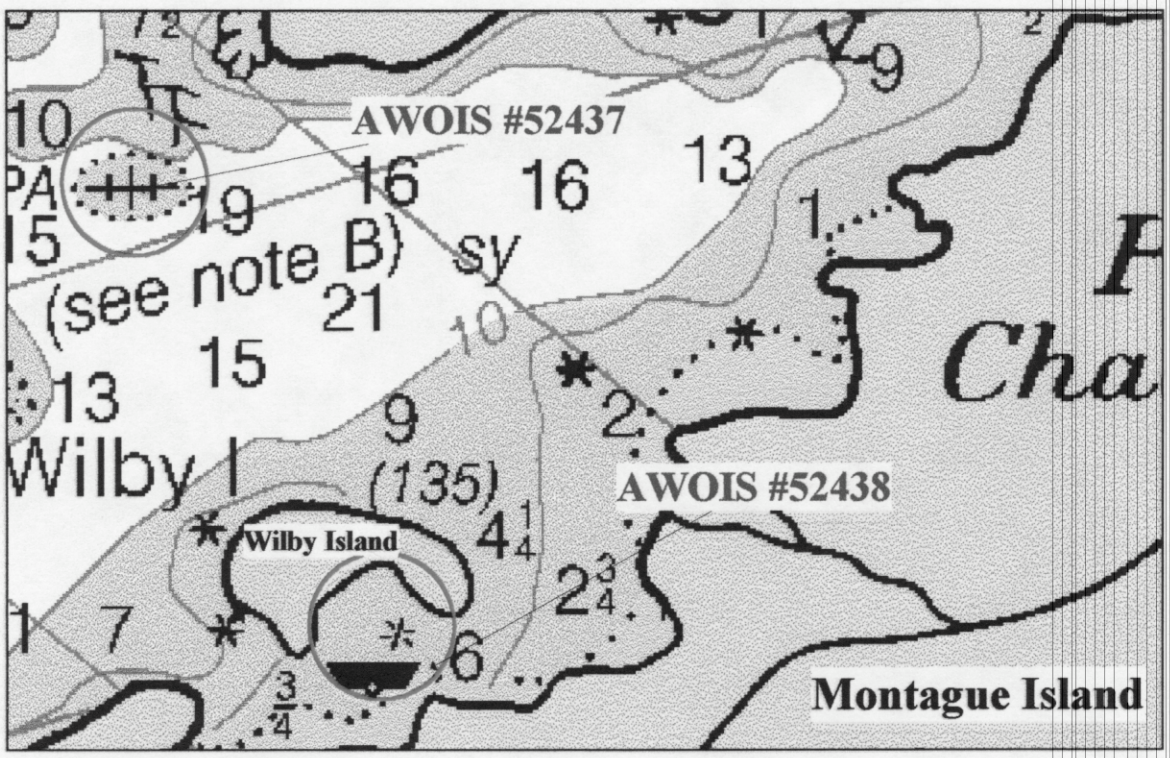


Figure 6. AWOIS items for H10919

AWOIS 52437

1. **Area of Investigation:**

AWOIS Number:	52437
State and Locality:	Port Chalmers, Alaska
Reported Position:	Latitude: 60/15/03.00N
	Longitude: 147/13/57.00W
	Datum: NAD83
Type of Feature:	Wreck
Reported Depth:	N/A

2. **Description of Source Item:** HISTORY: LNM15/96--17TH CGD, 4/9/96; THE "VIKING" SUNK IN APPROX. POS. LAT.60-15-03N, LONG. 147-13-57W (NAD 83). NO DESCRIPTION GIVEN. ENTERED 6/98 MCR

3. **Survey Requirements:** Multibeam investigation; Singlebeam investigation; 100% side scan. Dive investigation, 200-meter search radius.

4. **Method of Investigation:** Search radius was covered by 100% SWMB (DN 227, VN 2123; DN278, VN2121).

5. **Results of Investigation:** No evidence of the reported wreck was found. The depths found within the AWOIS search radius ranged between 11 and 20 fathoms. concur

6. **Comparison with Prior Surveys:** AWOIS 52437 was not investigated by any of the priors. The present survey found depths within the AWOIS search radius to be consistently shoaler by 1-2 fathoms than the prior survey. ✓

7. **Comparison with the Chart and Charting Recommendation:**
AWOIS 52437 was compared to Chart 16700 (26th Ed.; September 19, 1998, 1:200,000), Chart 16701 (17th Ed.; July 25, 1998, 1:81,436), and Chart 16709 (21st Ed.; June 29, 1996, 1:80,000, 1:80,000). This item was not submitted as a Danger to Navigation. Figure 7 below depicts the wreck on chart 16709. ✓

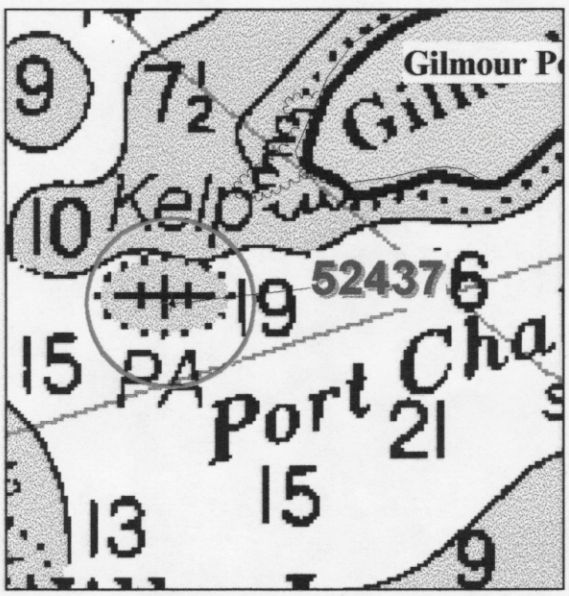


Figure 7. AWOIS 52437

The Hydrographer recommends removing the wreck symbol and charting soundings acquired by this survey.
concur

AWOIS 52438

1. **Area of Investigation:**

AWOIS #:	52438
State and Locality:	Port Chalmers, Alaska
Reported Position:	Latitude: 60/14/23.76N
	Longitude: 147/13/12.900
	Datum: NAD83
Type of Feature:	Obstruction
Reported Depth:	8 fathoms

2. **Description of Source Item:** HISTORY: LNM47/78--11/21/78, 17TH CGD; BLUE/BLACK MOORING BUOY ESTABLISHED BY ALASKA DEPT. OF FISH AND GAME. POS. LAT.60-14-26N, LONG.147-13-06W (NAD 83). ENTERED 6/98 MCR

3. **Survey Requirements:** Visual search, VBES

4. **Method of Investigation:** A 15-minute visual search in 3 meters of water with 2 meter water visibility and VBES developments within the AWOIS search radius.

5. **Results of Investigation:** An orange mooring buoy was found ~~37 meters away~~ at 60°14'24.74"N, 147°12'53.17"W (see Pos. #20175). CONCUR

6. **Comparison with Prior Surveys:** AWOIS 52438 was not investigated by any of the priors. Present survey soundings were consistently shoaler by 2-3 fathoms.

7. **Comparison with the Chart and Charting Recommendation:** AWOIS 52438 was compared to Chart 16700 (26th Ed.; September 19, 1998, 1:200,000), Chart 16701 (17th Ed.; July 25, 1998, 1:81,436), and Chart 16709 (21st Ed.; June 29, 1996, 1:80,000, 1:80,000). The mooring buoy was not charted on Chart 16700, but is charted on both Chart 16701 and 16709. This item was not submitted as a Danger to Navigation. Illustration 8 below depicts the charted mooring buoy and the position of the new mooring buoy (Pos. #20175 - in red).

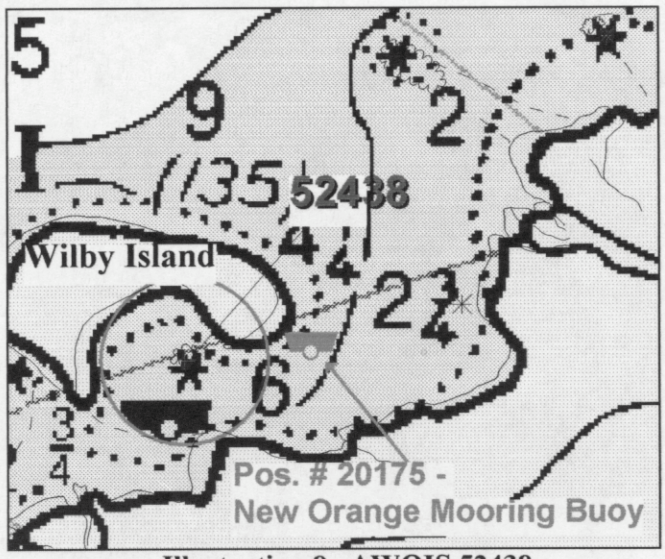


Illustration 8. AWOIS 52438

The Hydrographer recommends changing the charted position of the mooring buoy to that acquired by the present survey. CONCUR

N. COMPARISON WITH THE CHART (SEE EVAL. REPORT, SECTION O.)

Survey H10919 was compared to Chart 16700 (26th Ed.; September 19, 1998, 1:200,000), Chart 16701 (17th Ed.; July 25, 1998, 1:81,436), and Chart 16709 (21st Ed.; June 29, 1996, 1:80,000, 1:80,000).

The present survey was generally 0.5 to 4 fathoms shoaler than Chart 16700. Similarly, the present survey was consistently 1 to 3 fathoms shoaler than Chart 16701. Depths from Chart 16709 were consistently 2-3 fathoms deeper. Notable differences are addressed below. ✓ CONCUR

In the vicinity of a charted 5.0-fathom sounding (Charts 16701, 16709) at 60°13'41.033"N, 147°15'30.168"W, the present survey revealed a shoaler depth of 0.8 fathoms (Pos. #86773). ✓

A depth of 17.8 fathoms at 60°16'57.934"N, 147°16'35.543"W (Pos. #78158) was found in the vicinity of a charted 23-fathom (Charts 16701 and 16709). ✓

This survey found a deeper depth of 18.6 fathoms at 60°15'17.771"N, 147°18'8.888"W (Pos. #81150) in the vicinity of a charted 17-fathom sounding (Charts 16700, 16701, and 16709). This area was covered by 100% shallow-water multibeam. ✓

Non-sounding features are discussed in Section I. Shoreline. Final sounding comparisons will be made at the Pacific Hydrographic Branch after application of approved tides. ✓

Dangers to Navigation

Twenty-four Dangers to Navigation were found and reported to the Seventeenth Coast Guard District.

A rock uncovered at –0.3 fathoms (Pos. #74211) was discovered at 60°16'16.074"N, 147°14'36.837"W, near a charted 2 ¼-fathom sounding (Charts 16700, 16701, and 16709). ✓

A rock uncovered at ~~–0.1~~ 0.0 fathoms (Pos. #91579) was discovered at 60°16'29.135"N, 147°13'23.749"W, near a charted 1 ½-fathom sounding (Charts 16700, 16701, and 16709). ✓

A rock awash (Pos. #71913) was discovered at 60°14'20.721"N, 147°16'20.130"W, near a charted 2 ¾-fathom sounding (Charts 16700, 16701, and 16709). ✓

A shoal depth of 0.4 fathoms (Pos. #91467) was discovered at 60°15'35.174"N, 147°15'08.123"W, near a charted 1 ½-fathom sounding (Charts 16700, 16701, and 16709). ✓

A shoal depth of ~~0.4~~ 0.5 fathoms (Pos. #42407) was discovered at 60°13'30.35"N, 147°16'29.14"W, near a charted 9-fathom sounding (Charts 16700, 16701, and 16709). ✓

A shoal depth of 0.8 fathoms (Pos. #91510) was discovered at 60°16'0.608"N, 147°13'45.397"W, near a charted 2 ¼-fathom sounding (Charts 16700, 16701, and16709). ✓

A shoal depth of 1 fathom (Pos. #89156) was discovered at 60°15'32.605"N, 147°14'31.199"W, near a charted 2 ¼-fathom sounding (Charts 16700, 16701, and 16709). ✓

A shoal depth of 1.3 fathoms (Pos. #89236) was discovered at 60°15'29.439"N, 147°13'38.967"W, near a charted 3 ¾-fathom sounding (Charts 16700, 16701, and 16709). This danger is located near Gilmour Point. ✓

A shoal depth of 1.4 fathoms (Pos. #91431) was discovered at 60°14'47.593"N, 147°16'3.927"W. This danger lies near a charted 3 ¾-fathom sounding (Charts 16700, 16701, 16709).

A shoal depth of 1.4 fathoms (Pos. #91572) was discovered at 60°16'28.260"N, 147°13'59.232"W near a charted 6 ¾-fathom sounding (Charts 16700, 16701, 16709).

A shoal depth of 1.8 fathoms (Pos. #77216) was discovered at 60°15'53.108"N, 147°15'14.663"W. This danger lies on a charted 7-fathom sounding (Charts 16701 and 16709). On Chart 16700, this danger is found between 14, 18, 1 ½ -fathom soundings.

A shoal depth of 1.9 fathoms (Pos. #77707) was discovered at 60°16'44.098"N, 147°12'52.249"W. This danger lies near a charted 9-fathom sounding (Charts 16701, 16709) and near a charted 13-fathom on Chart 16700.

A shoal depth of ~~2.0~~ 1.9 fathoms (Pos. #90075) was discovered at 60°15'3.201"N, 147°15'50.319"W. This danger lies near a charted 6 ¾-fathom sounding (Charts 16701, 16709).

A shoal depth of 3.2 fathoms (Pos. #90542) was discovered at 60°14'54.02"N, 147°15'12.36"W. This danger lies on a charted 6 ¾ -fathom sounding (Charts 16701, 16709. The consistent shoaling in the area from this depth to the north end of the small wooded island disrupts the described route into Port Chalmers found in Coast Pilot #9. The Hydrographer recommends altering the Coast Pilot route designated into Port Chalmers.

A shoal depth of 3.4 fathoms (Pos. #84303) was discovered at 60°14'36.648"N, 147°18'43.776"W. This danger lies near a charted 5 ¼-fathom sounding (Charts 16700, 16701, 16709).

A shoal depth of 3.8 fathoms (Pos. #86996) was discovered at 60°14'23.752"N, 147°12'58.834"W. This danger lies near a charted 6-fathom sounding (Charts 16701, 16709).

A shoal depth of 4.4 fathoms (Pos. #91355) was discovered at 60°14'28.937"N, 147°18'30.881"W. This danger lies near a charted 7.0-fathom sounding (Charts 16701, 16709) and a charted 5 ¼-fathoms on Chart 16700.

A shoal depth of ~~6.9~~ 6.8 fathoms (Pos. #91171) was discovered at 60°15'15.742"N, 147°11'40.229"W. This danger lies near a charted 9-fathom sounding (Charts 16701, 16709) and is located near the charted anchorage site.

A shoal depth of 7.5 fathoms (Pos. #89354) was discovered at 60°14'03.34"N, 147°18'45.77"W. This danger lies near a charted 9-fathom sounding (Charts 16701, 16709) and is located near the charted anchorage site.

A shoal depth of 7.2 fathoms (Pos. #72700) was discovered at 60°14'58.002"N, 147°16'27.645"W. This danger lies between charted 9, 11 and 13-fathom soundings (Charts 16701, 16709). This sounding lies within the entry into Port Chalmers designated by Coast Pilot #9. The Hydrographer recommends altering the route into Port Chalmers.

A shoal depth of 7.3 fathoms (Pos. #25556) was discovered at 60°15'42.038"N, 147°13'0.925"W. This danger lies between two charted 12-fathom soundings (Charts 16701, 16709).

A shoal depth of 8.8 fathoms (Pos. #83222) was discovered at 60°14'11.631"N, 147°17'23.059"W. This danger lies between a charted 18 and 13-fathom sounding (Chart 16701, 16709) and near a charted 13-fathom sounding (Charts 16700).

A shoal depth of ~~9.4~~ 9.5 fathoms (Pos. #75654) was discovered at at 60°15'58.906"N, 147°14'12.290"W, near a charted 15-fathom sounding (Charts 16701 and 16709). ✓

A shoal depth of 9.4 fathoms (Pos. #82416) was discovered at 60°16'10.112"N, 147°16'20.772"W, near a charted 15-fathom sounding (Charts 16701 and 16709). ✓

A copy of the Danger to Navigation report is included in Appendix A. ATTACHED

O. ADEQUACY OF SURVEY (SEE EVAL. REPORT, SECTION P.)

Survey H10919 is complete and adequate to supersede charted soundings and features in their common areas. Near one-hundred percent shallow-water multibeam coverage was obtained in all areas with depths between 5 and 65 meters.

P. AIDS TO NAVIGATION (SEE EVAL. REPORT, SECTION Q)

No aids to navigation were located within the H10919 survey area. ✓ CONCUR

Q. STATISTICS

Refer to the Survey Information Summary attached to this report. ✓ CONCUR

R. MISCELLANEOUS

Bottom samples were collected and sent to the Smithsonian Institute in accordance with the Project Instructions. Areas of high eel grass concentrations were delineated on the DP plot as requested. Tide rips* were experienced at the location charted on Charts 16700, 16701, and 16709. No unusual magnetic variations were found during this survey. ✓ CONCUR * RETAIN TIDE RIPS AT CURRENT CHARTED LOCATION.

During data acquisition, the survey area was infrequently visited by fishing vessels that worked inside the Port Chalmers area. Port Chalmers is a suitable small vessel anchorage.** RAINIER found suitable anchorage approximately 2.5 nautical miles west of Gilbert Point on Montague Island. ** RETAIN ANCHOR SYMBOL AT CURRENT CHARTED LOCATION.

S. RECOMMENDATIONS

The Hydrographer recommends retaining Note B on Chart 16701 until all of Montague Strait is completely surveyed and possibly adding the note to Charts 16709 and 16700. ✓ CONCUR

T. REFERRAL TO REPORTS

The following supplemental reports contain additional information relevant to this survey:

Title	Date Sent	Office
OPR-P139-RA-99 1999 Coast Pilot Report	TBD	N/CS26
Project Related Data for OPR-P139-RA-99	December 1999	N/CS34

Respectfully Submitted,

Winli Lin
Senior Survey Technician, NOAA

Approved and Forwarded,

Daniel R. Herlihy
Commander, NOAA
Commanding Officer

Survey Information Summary

Project OPR-P139-RA

Project Name SOUTHWEST PRINCE WILLIAM SOUND

Instructions Dated 7/30/99

Project Change Info

Sheet Letter AN

Registry Number H10919

Sheet Number RA-10-16-99

Survey Title Port Chalmers

Data Acquisition Dates **From:** 12-Aug-99 224 **To:** 11-Oct-99 284

Vessel Usage Summary

VESNO	MS	SPLITS	DEV	XL	S/L	DP	BS	SWMB	DIVE
2121								2	
2122	2	3	1		1	2			
2123		1		1				4	
2124	3			1					
2125	4			3	2	2	1		
2126								2	

Sound Velocity Cast Information

HPS Table	Cast DN	Max Depth	Position	Applicable DN
2	224	187.1	60/12/00 147/18/00	223-235
4	243	183.1	60/19/01 147/17/30	236-253
6	254	209.1	60/24/30 147/07/10	254-260
9	266	142	60/16/51 147/17/21	261-267
12	270	329.3	60/11/00 147/41/10	268-274
13	277	293.2	60/27/24 147/09/36	278-285
14	286	369.9	60/17/18 147/35/24	286-293

Tide Zone Information

Zone #	Time Corr.	Height Corr.
PWS8	-00 hr 06 min	0.95
PWS15	-00 hr 06 min	0.93

Tide Gauge Information

Tide Gauge #	Gauge Name	Installed	Removed
945-4411	ZAIKOFF POINT	8/10/99	10/14/99
945-4511	PORT CHALMERS	8/10/99	10/20/99
945-4662	SNUG HARBOR	8/11/99	10/20/99

Statistics Summary

Type	Total
BS	12
DP	77
MS	159.1
S/L	16.17
SPLIT	14.37
SWMB	161.8
XL	51.36

Percent XL:	32.3
SQNM:	10.91

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of NOAA Corps Operations
Pacific Marine Center
1801 Fairview Avenue East
Seattle, Washington 98102-3767
NOAA Ship RAINIER

November 17, 1999

Commander (mon)
Seventeenth Coast Guard District
Post Office Box 25517
Juneau, Alaska 99802-5517

Dear CDR Hamblett:

It is requested that the following dangers to navigation be included in the Local Notice to Mariners. The NOAA Ship RAINIER positioned these features while conducting hydrographic survey H10919 in Prince William Sound, Alaska, in August through October 1999. The dangers are shown graphically on the attached chartlet.

The following dangers to navigation affect the following charts:

Chart	Scale	Edition	Date
16700	1:200,000	26th	19-Sep-98
16701	1:81,436	17th	25-Jul-98
16709	1:80,000	21st	29-Jun-96

The positions are on the NAD 83 datum and depths have been corrected to Mean Lower Low Water.

Feature	Depth (fm)	Latitude (N)	Longitude (W)	Depth (m)
Shoal	Uncovers	60° 16' 16.074"	147° 14' 36.837"	-
Rock	Uncovers	60° 16' 29.135"	147° 13' 23.749"	-
Rock	Awash	60° 14' 20.721"	147° 16' 20.130"	0.0
Shoal	0.4	60° 13' 30.35"	147° 16' 29.14"	0.8
Shoal	0.4	60° 15' 35.174"	147° 15' 08.123"	0.7
Shoal	0.5	60° 16' 02.064"	147° 13' 42.401"	0.9
Shoal	1	60° 15' 32.605"	147° 14' 31.199"	1.9
Shoal	1.3	60° 15' 29.439"	147° 13' 38.967"	2.4
Shoal	1.4	60° 14' 47.593"	147° 16' 03.927"	2.7
Shoal	1.4	60° 16' 28.260"	147° 13' 59.232"	2.7
Shoal	1.8	60° 15' 53.108"	147° 15' 14.663"	3.4
Shoal	1.9	60° 16' 44.098"	147° 12' 52.249"	3.5
Shoal	2	60° 15' 03.201"	147° 15' 50.319"	3.7
Shoal	3.2	60° 14' 54.02"	147° 15' 12.36"	5.9
Shoal	3.4	60° 14' 36.648"	147° 18' 43.776"	6.3
Shoal	3.8	60° 14' 23.752"	147° 12' 58.834"	7.0
Shoal	4.4	60° 14' 28.937"	147° 18' 30.881"	8.2
Shoal	6.9	60° 15' 15.742"	147° 11' 44.229"	12.6
Shoal	7.2	60° 14' 58.002"	147° 16' 27.645"	13.3
Shoal	7.3	60° 15' 42.038"	147° 13' 0.925"	13.4
Shoal	7.5	60° 14' 03.34"	147° 18' 45.77"	13.7
Shoal	8.8	60° 14' 11.631"	147° 17' 23.059"	16.2
Shoal	9.4	60° 16' 10.112"	147° 16' 20.772"	17.3
Shoal	9.4	60° 15' 58.906"	147° 14' 12.290"	17.3

This is advance information subject to office review. Questions concerning this letter should be directed to the Chief, Pacific Hydrographic Branch, (206) 526-6835. Refer to survey project OPR-P139-RA-99 and Danger to Navigation message RA-21-99. More information on current RAINIER survey projects may be obtained by e-mail; contact the Field Operations Officer at FOO.RAINIER@NOAA.GOV.

Sincerely,

Daniel R. Herlihy

Daniel R. Herlihy
Commander, NOAA
Commanding Officer

Attachment

cc: NIMA
N/CS261
PMC
N/CS34


NOAA Ship RAINIER
Hydrographic Survey H10919
Chart 16701, 17th ed., July 25, 1998
Scale shown 1:40,000
November 17, 1999
This graphic may not be up-to-date with all Notice to Mariners information. Use only as a guide in locating potential dangers described elsewhere in this Notice to Mariners. Do not paste onto NOAA charts.
Rock uncovers
60/16/16.074 N
147/14/36.837 W
1.4 fathom shoal
60/16/28.260 N
147/13/59.232 W
1.9 fathom shoal
60/16/44.098 N
147/12/52.249 W
Rock uncovers
60/16/29.135 N
147/13/23.749 W
1.8 fathom shoal
60/15/53.108 N
147/15/14.663 W
9.4 fathom shoal
60/16/10.112 N
147/16/20.772 W
0.5 fathom shoal
60/16/02.064 N
147/13/42.401 W
0.4 fathom shoal
60/15/35.174 N
147/15/08.123 W
9.4 fathom shoal
60/15/58.906 N
147/14/12.290 W
2 fathom shoal
60/15/03.201 N
147/15/50.319 W
7.2 fathom shoal
60/14/58.002 N
147/16/27.645 W
1.3 fathom shoal
60/15/29.439 N
147/13/38.967 W
7.3 fathom shoal
60/15/42.038 N
147/13/0.925 W
1 fathom shoal
60/15/32.605 N
147/14/31.199 W
Tide Rips
3.4 fathom shoal
60/14/36.648 N
147/18/43.776 W
8.8 fathom shoal
60/14/11.631 N
147/17/23.059 W
3.2 fathom shoal
60/14/54.02 N
147/15/12.36 W
Port Chalmers
1.4 fathom shoal
60/14/47.593 N
147/16/03.927 W
6.3 fathom shoal
60/15/15.742 N
147/11/44.229 W
Wilby I
4.4 fathom shoal
60/14/28.937 N
147/18/30.881 W
3.8 fathom shoal
60/14/23.752 N
147/12/58.834 W
Rock awash
60/14/20.721 N
147/16/20.130 W
7.5 fathom shoal
60/14/03.34 N
147/18/45.77 W
0.4 fathom shoal
60/13/30.35 N
147/16/29.14 W

Date: 12/2/1999
Sender: FOO Rainier
To: Chief Survey Technician Rainier, Lynn [NDS-NCG22] Preston, navinfonet@nima.mil, lnm@cgalaska.uscg.mil, Dennis.Hill@noaa.gov
Priority: Normal
Subject: DTON Message RA-21-99

It is requested that the following dangers to navigation be included in the Local Notice to Mariners. The NOAA Ship RAINIER positioned these features while conducting hydrographic survey H10919 in Prince William Sound, Alaska, in August through October 1999.

The following dangers to navigation affect charts 16700(scale 1:200,000; 26th edition, 19-Sep-98); 16701(scale 1:81,436; 17th edition, 25-Jul-98); and 16709(scale 1:80,000; 21st edition, 29-Jun-96).

The positions are on the NAD 83 datum and depths have been corrected to Mean Lower Low Water.

Feature: Shoal
Depth: Uncovers
Latitude: 60/16/16.074 N
Longitude: 147/14/36.837 W

Feature: Rock
Depth: Uncovers
Latitude: 60/16/29.135 N
Longitude: 147/13/23.749 W

Feature: Rock
Depth: Awash
Latitude: 60/14/20.721 N
Longitude: 147/16/20.130 W

Feature: Shoal
Depth: 0.4 fathoms
Latitude: 60/13/30.35 N
Longitude: 147/16/29.14 W

Feature: Shoal
Depth: 0.4 fathoms
Latitude: 60/15/35.174 N
Longitude: 147/15/08.123 W

Feature: Shoal
Depth: 0.5 fathoms
Latitude: 60/16/02.064 N
Longitude: 147/13/42.401 W

Feature: Shoal
Depth: 1 fathom
Latitude: 60/15/32.605 N
Longitude: 147/14/31.199 W

Feature: Shoal
Depth: 1.3 fathoms
Latitude: 60/15/29.439 N
Longitude: 147/13/38.967 W

Feature: Shoal
Depth: 1.4 fathoms
Latitude: 60/14/47.593 N
Longitude: 147/16/03.927 W

Feature: Shoal
Depth: 1.4 fathoms
Latitude: 60/16/28.260 N
Longitude: 147/13/59.232 W

Feature: Shoal
Depth: 1.8 fathoms
Latitude: 60/15/53.108 N
Longitude: 147/15/14.663 W

Feature: Shoal
Depth: 1.9 fathoms
Latitude: 60/16/44.098 N
Longitude: 147/12/52.249 W

Feature: Shoal
Depth: 2 fathoms
Latitude: 60/15/03.201 N
Longitude: 147/15/50.319 W

Feature: Shoal
Depth: 3.2 fathoms
Latitude: 60/14/54.02 N
Longitude: 147/15/12.36 W

Feature: Shoal
Depth: 3.4 fathoms
Latitude: 60/14/36.648 N
Longitude: 147/18/43.776 W

Feature: Shoal
Depth: 3.8 fathoms
Latitude: 60/14/23.752 N
Longitude: 147/12/58.834 W

Feature: Shoal
Depth: 4.4 fathoms
Latitude: 60/14/28.937 N
Longitude: 147/18/30.881 W

Feature: Shoal
Depth: 6.9 fathoms
Latitude: 60/15/15.742 N
Longitude: 147/11/44.229 W

Feature: Shoal
Depth: 7.2 fathoms
Latitude: 60/14/58.002 N
Longitude: 147/16/27.645 W

Feature: Shoal
Depth: 7.3 fathoms
Latitude: 60/15/42.038 N
Longitude: 147/13/0.925 W

Feature: Shoal
Depth: 7.5 fathoms
Latitude: 60/14/03.34 N
Longitude: 147/18/45.77 W

Feature: Shoal
Depth: 8.8 fathoms
Latitude: 60/14/11.631 N
Longitude: 147/17/23.059 W

Feature: Shoal
Depth: 9.4 fathoms
Latitude: 60/16/10.112 N
Longitude: 147/16/20.772 W

Feature: Shoal
Depth: 9.4 fathoms
Latitude: 60/15/58.906 N
Longitude: 147/14/12.290 W

This is advance information subject to office review. Questions concerning this letter should be directed to the Chief, Pacific Hydrographic Branch, (206) 526-6835. Refer to survey project OPR-P139-RA-99 and Danger to Navigation message RA-21-99. More information on current RAINIER survey projects may be obtained by e-mail; contact the Field Operations Officer at FOO.RAINIER@NOAA.GOV.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF COAST SURVEY
Pacific Hydrographic Branch
Seattle, Washington 98115-0070

January 7, 2000

Commander (OAN)
Seventeenth Coast Guard District
P.O. Box 25517
Juneau, AK 99802

Dear Sir:

During office review of hydrographic survey H-10919, Alaska, Southwest Prince William Sound, Port Chalmers, eight shoal depths were found and are considered to be potential dangers to navigation.

It is recommended that the enclosed Report of Dangers to Navigation be included in the Local Notice to Mariners.

Questions concerning this report should be directed to the Pacific Hydrographic Branch at (206) 526-6836.

Sincerely,

James C. Gardner
Commander, NOAA
Chief, Pacific Hydrographic Branch

D to N checked.
1-13-2000
Doug Doles

Enclosure

cc: NIMA
NCS/261
NOAA Navigation Advisor, Alaska

REPORT OF DANGERS TO NAVIGATION

Hydrographic Survey Registry Number: H-10919

Survey Title: State: ALASKA
Locality: SOUTHWEST PRINCE WILLIAM SOUND
Sublocality: PORT CHALMERS

Project Number: OPR-P139-RA

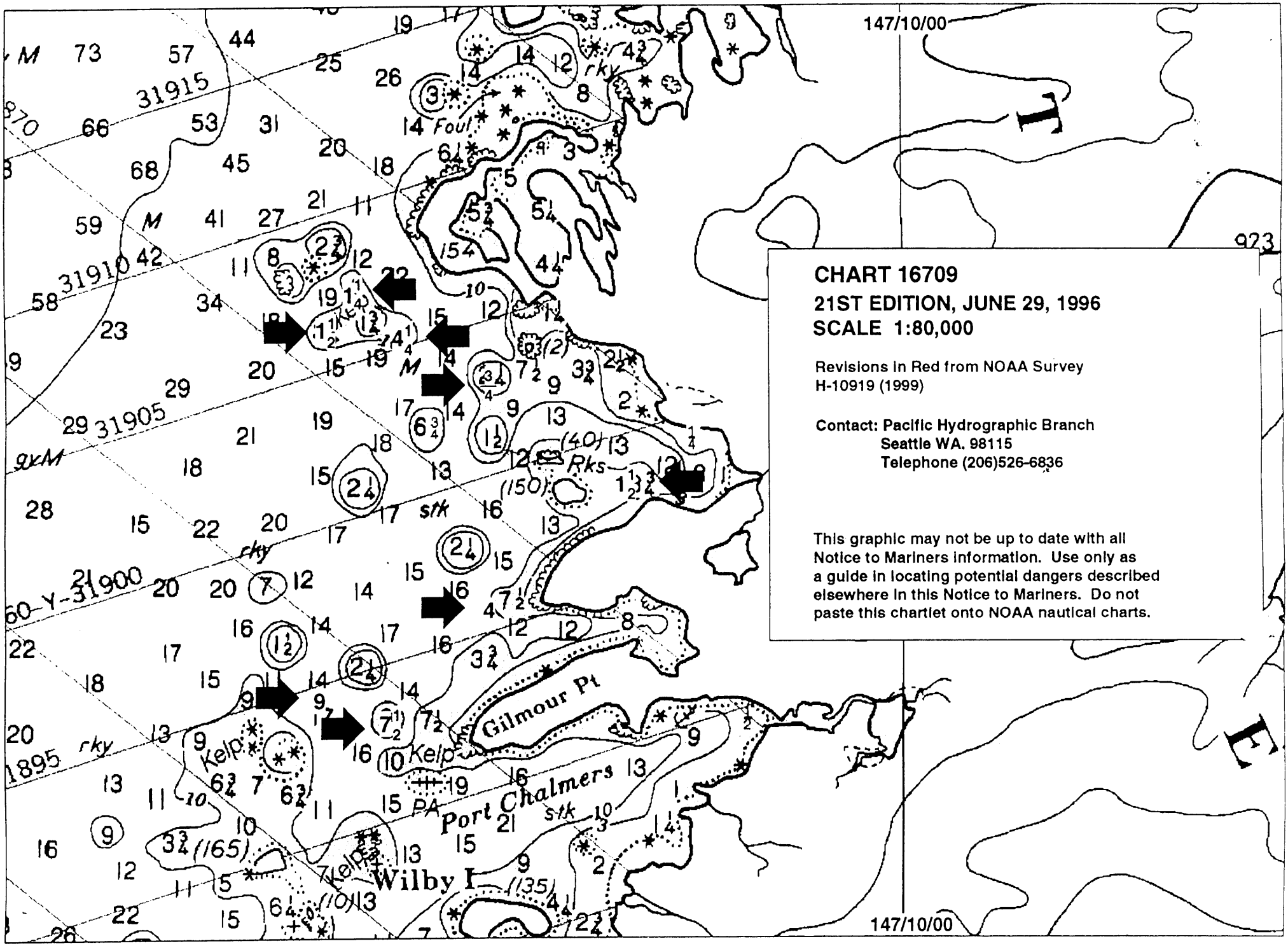
Survey Date: AUGUST 12, - OCTOBER 11, 1999

Soundings are reduced to Mean Lower Low Water using predicted tides and are positioned on NAD 83.

Charts affected: 16709 21st Edition June 29, 1996, scale 1:80,000, NAD 83
16701 17th Edition July 25, 1998, scale 1:81,436, NAD 83

DANGER TO NAVIGATION	LATITUDE(N)	LONGITUDE(W)
9.2 fathom sounding	60/15/24.12	147/14/51.36
7.4 fathom sounding	60/15/18.72	147/14/13.92
4.0 fathom sounding	60/15/46.80	147/13/27.48
1.7 fathom sounding	60/16/18.12	147/12/16.92
0.8 fathom sounding	60/16/42.60	147/13/27.12
4.3 fathom sounding	60/16/54.48	147/14/08.16
1.6 fathom sounding	60/16/56.64	147/14/46.68
1.3 fathom sounding	60/17/05.64	147/14/32.64

Questions concerning this report should be directed to the Chief, Pacific Hydrographic Branch at (206)526-6836.


147/10/00
CHART 16709
21ST EDITION, JUNE 29, 1996
SCALE 1:80,000
Revisions in Red from NOAA Survey
H-10919 (1999)
Contact: Pacific Hydrographic Branch
Seattle WA. 98115
Telephone (206)526-6836
This graphic may not be up to date with all Notice to Mariners information. Use only as a guide in locating potential dangers described elsewhere in this Notice to Mariners. Do not paste this chartlet onto NOAA nautical charts.
Gilmour Pt
Port Chalmers
Wilby I
Kelp
Foul
Rks
rky
stk
PA
147/10/00

APPROVAL SHEET

for

H10919

Standard field surveying and processing procedures were followed in producing this examination in accordance with the Hydrographic Manual, Fourth Edition; the Hydrographic Survey Guidelines; and the Field Procedures Manual, as updated for 1999.

The digital data and supporting records have been reviewed by me, are considered complete and adequate for charting purposes, and are approved. All records are forwarded for final review and processing to N/CS34, Pacific Hydrographic Branch.

Approved and Forwarded,

Daniel R. Herlihy
Commander, NOAA
Commanding Officer
NOAA Ship RAINIER

Final tide zone node point locations for OPR-P139-RA-99,
Sheet H-10919.

Format: Longitude in decimal degrees (negative value denotes Longitude West),
Latitude in decimal degrees
Tide Station (in recommended order of use)
Average Time Correction (in minutes)
Range Correction

	Tide Station Order	AVG Time Correction	Range Correction
Zone PWS42			
-147.703642 60.244653	945-4662	-6	1.02
-147.738627 60.227865			
-147.792175 60.19276			
-147.781996 60.187238			
-147.773635 60.161998			
-147.606335 60.147238			
-147.411023 60.097978			
-147.325832 60.179367			
-147.487763 60.226861			
-147.604351 60.274729			
-147.674795 60.308452			
-147.740374 60.278784			
-147.726093 60.266771			
-147.703642 60.244653			
Zone PWS44			
-147.325832 60.179367	945-4511	-6	1.00
-147.291846 60.195367			
-147.289814 60.210781			
-147.311642 60.219369			
-147.306057 60.224673			
-147.295905 60.221895			
-147.283464 60.226381			
-147.41572 60.264551			
-147.487763 60.226861			
-147.325832 60.179367			
Zone PWS45			
-147.212948 60.329021	945-4511	0	1.00
-147.343216 60.302686			
-147.41572 60.264551			

-147.283464 60.226381
-147.295905 60.221895
-147.306057 60.224673
-147.311642 60.219369
-147.289814 60.210781
-147.240065 60.224421
-147.241203 60.235531
-147.233297 60.237325
-147.227624 60.241526
-147.224706 60.254395
-147.182745 60.260462
-147.15325 60.323765
-147.212948 60.329021

Zone PWS46

-147.224706 60.254395	945-4511	0	1.02
-147.227624 60.241526			
-147.233297 60.237325			
-147.241203 60.235531			
-147.231939 60.229788			
-147.205415 60.238623			
-147.18638 60.248971			
-147.182745 60.260462			
-147.224706 60.254395			

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: May 15, 2000

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-P139-RA-99
HYDROGRAPHIC SHEET: H-10919

LOCALITY: Southwest Prince William Sound, AK

TIME PERIOD: August 12 - October 11, 1999

TIDE STATION USED: 945-4511 Port Chalmers
Lat. 60° 14.5'N Lon. 147° 14.9'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.321 meters

TIDE STATION USED: 945-4662 Snug Harbor
Lat. 60° 14.4'N Lon. 147° 43.2'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.218 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: PWS42, PWS44 & PWS45, PWS46

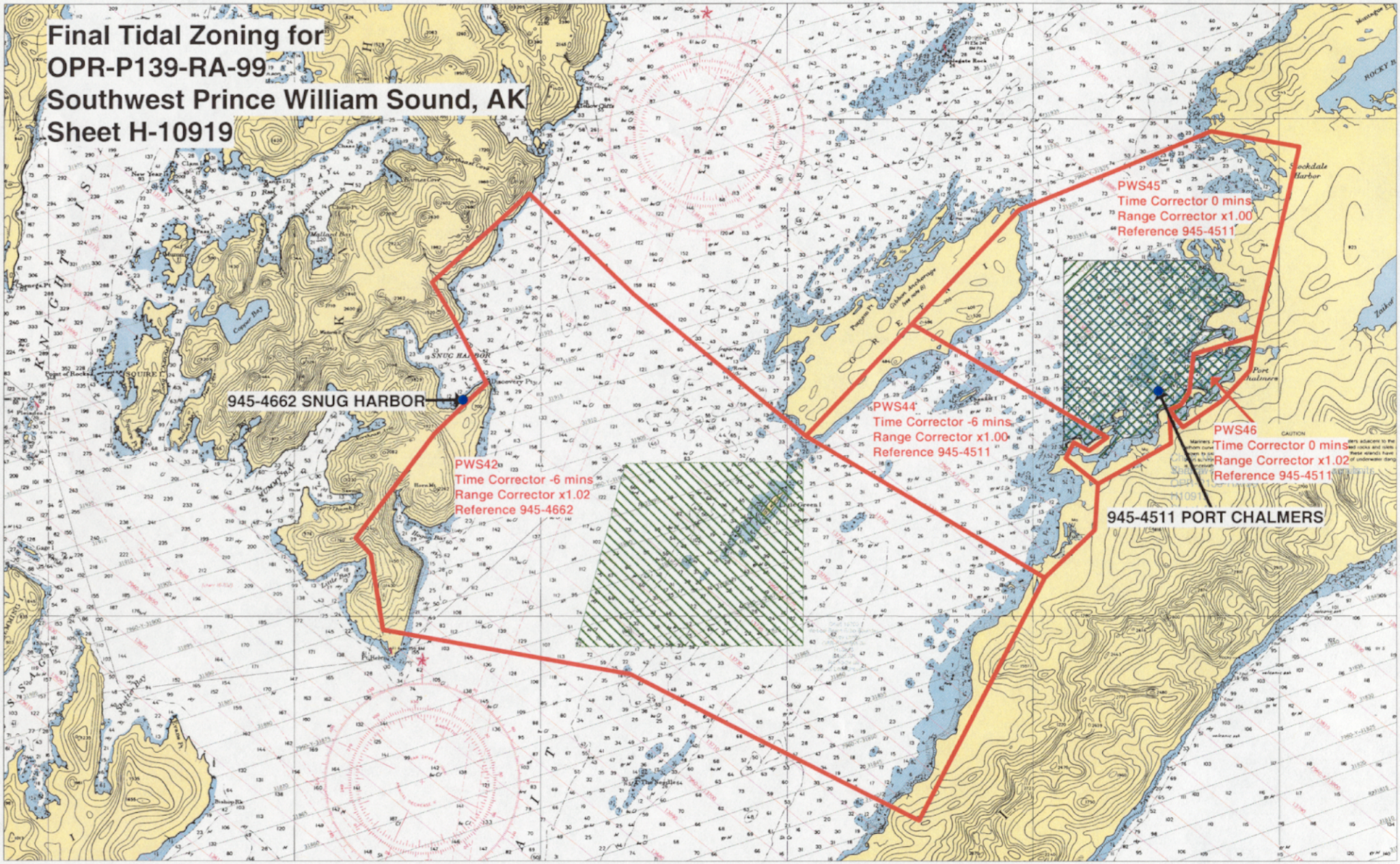
Refer to attachments for zoning information.

Note 1: Provided time series data are tabulated in metric units (Meters), relative to MLLW and on Greenwich Mean Time.

Note 2: Use tide data from the appropriate station with applicable zoning correctors for each zone according to the order in which they are listed in the Tidezone corrector files. For example, tide station one (TS1) would be the first choice for an applicable zone followed by TS2, etc. when data are not available.

Thomas N. Neu 5/16/00

CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION


Final Tidal Zoning for
OPR-P139-RA-99
Southwest Prince William Sound, AK
Sheet H-10919
945-4662 SNUG HARBOR
PWS42
Time Corrector -6 mins
Range Corrector x1.02
Reference 945-4662
PWS44
Time Corrector -6 mins
Range Corrector x1.00
Reference 945-4511
PWS45
Time Corrector 0 mins
Range Corrector x1.00
Reference 945-4511
PWS46
Time Corrector 0 mins
Range Corrector x1.02
Reference 945-4511
945-4511 PORT CHALMERS

NOAA FORM 76-155 (11-72)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

GEOGRAPHIC NAMES

SURVEY NUMBER

H-10919

Name on Survey	A ON CHART NO. 16700, 16701, 16709	B ON PREVIOUS SURVEY NO.	C ON U.S. QUADRANGLE MAPS	D FROM LOCAL INFORMATION	E ON LOCAL MAPS	F P.O. GUIDE OR MAP	G RAND MCNALLY ATLAS	H	K U.S. LIGHT LIST	
ALASKA (title)	X		X							1
GILMOUR POINT	X		X							2
MONTAGUE ISLAND	X		X							3
MONTAGUE STRAIT	X		X							4
PORT CHALMERS	X		X							5
PRINCE WILLIAM SOUND (title)	X		X							6
WILBY ISLAND	X		X	[redacted]						7
										8
				Dennis J. Ramsling						9
				Chief Cartographer						10
										11
										12
										13
										14
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FEB 23 2000

NOAA FORM 76-155 SUPERSEDES C&GS 197

NOAA FORM 77-27(H) (9-83)

U.S. DEPARTMENT OF COMMERCE

HYDROGRAPHIC SURVEY STATISTICS

REGISTRY NUMBER: H10919

RECORDS ACCOMPANYING SURVEY: To be completed when survey is processed

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	SMOOTH OVERLAYS: POS., ARC, EXCESS	
DESCRIPTIVE REPORT	1	FIELD SHEETS AND OTHER OVERLAYS	

DESCRIPTION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/ SOURCE DOCUMENTS	
ACCORDION FILES						
ENVELOPES						
VOLUMES						
CAHIERS						
BOXES						

SHORELINE DATA

SHORELINE MAPS (List): T-12711,T-12714, and T12715

PHOTOBATHYMETRIC MAPS (List): n/a

NOTES TO THE HYDROGRAPHER (List): n/a

SPECIAL REPORTS (List): n/a

NAUTICAL CHARTS (List):

OFFICE PROCESSING ACTIVITIES

The following statistics will be submitted with the cartographer's report on the survey

PROCESSING ACTIVITY	AMOUNTS VERIFICATION	AMOUNTS EVALUATION	AMOUNTS TOTALS
POSITIONS ON SHEET			
POSITIONS REVISED			
SOUNDINGS REVISED			
CONTROL STATIONS REVISED			

	TIME-HOURS VERIFICATION	TIME-HOURS EVALUATION	TIME-HOURS TOTALS
PRE-PROCESSING EXAMINATION			
VERIFICATION OF CONTROL			
VERIFICATION OF POSITIONS			
VERIFICATION OF SOUNDINGS			
VERIFICATION OF JUNCTIONS			
APPLICATION OF PHOTOBATHYMETRY			
SHORELINE APPLICATION/VERIFICATION			
COMPILATION OF SMOOTH SHEET			201
COMPARISON WITH PRIOR SURVEYS AND CHARTS			
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT			119
GEOGRAPHIC NAMES			
OTHER: (Chart Compilation)			103
*USE OTHER SIDE OF FORM FOR REMARKS — TOTALS			423

Pre processing Examination by	*Beginning Date* 12/06/1999	*Ending Date*
Verification of Field Data by R. Mayor and K. Sampadian	*Time (Hours)* 201	*Ending Date*
Verification Check by	*Time (Hours)*	*Ending Date*
Evaluation and Analysis by K. Sampadian	*Time (Hours)* 119	*Ending Date*
Inspection by	*Time (Hours)*	*Ending Date*

: U S GOVT. PRINTING OFFICE 1983: 764-008/6061

EVALUATION REPORT
H-10919

A. PROJECT
The hydrographer's report contains a complete discussion of the project information.

B. AREA SURVEYED
The survey area is adequately described in the hydrographer's report.

The hydrographer has determined the inshore limits of safe navigation by defining a Navigable Area Limit Line (NALL) throughout the survey area. Charted features and soundings inshore of this limit line have not been specifically addressed during survey operations and should be retained as charted. A page-size plot of the charted area depicting the specific limits of supersession accompanies this report as Attachment 1.

The bottom consists mainly of mud with additional components including shells and pebbles. Depths generally range from less than one fathom along the shoreline and in areas of shoal developments to 67 fathoms in the northwest region of the survey area.

C. SURVEY VESSELS
The hydrographer's report contains adequate information relating to survey vessels.

D. AUTOMATED DATA ACQUISITION AND PROCESSING
The acquisition and processing of data in the field has been adequately addressed in the hydrographer's report, section D.

Office processing of survey data was conducted using the same Computer Aided Resource Information System (CARIS) and Hydrographic Processing System (HPS) used by the hydrographer. MicroStation 95 was used during office processing to compile the smooth sheet.

Processed digital data for this survey exists in the standard HPS format, a database format using the .dbf extension. In addition, the smooth sheet drawing is filed in the MicroStation format, i.e., .dgn extension. Copies of these files have been forwarded to the Hydrographic Surveys Division and a backup copy retained at PHB. Database records forwarded are in the Internal Data Format (IDF) and are in compliance with specifications in existence at the time of survey processing.

The drawing files necessarily contain information that is not part of the HPS data set such as geographic names text, line-type data, and minor symbolization. In addition, those soundings deleted from the drawing for clarity purposes remain unrevised in the HPS digital files to preserve the integrity of the original hydrographic data set. Cartographic codes used to describe the digital data are those authorized by Hydrographic Survey Guideline No. 35 and No. 75.

The data are plotted using a Universal Transverse Mercator (UTM-Zone 6) projection and are depicted on a single sheet.

E. SONAR EQUIPMENT
Side scan sonar equipment was not used.

F. SOUNDING EQUIPMENT
Sounding equipment has been adequately addressed in the hydrographer's report.

G. CORRECTIONS TO SOUNDINGS
Soundings and elevations below Mean High Water (MHW) have been reduced to Mean Lower Low Water (MLLW). The reducers include corrections for an actual tide, dynamic draft, and

sound velocity. Additional reducers for multibeam survey data include heave, pitch and roll. These reducers have been reviewed and are consistent with NOS specifications.

Unverified tide data for station Cordova, AK (945-4050) were used for reduction of soundings during field processing. During office processing, soundings and elevations have been reduced to Mean Lower Low Water (MLLW) or Mean High Water (MHW) as appropriate with verified tide correctors obtained from the Center for Operational Oceanographic Products and Services (CO-OPS). The correctors are zoned from tide gauge Port Chalmers, Alaska, 945-4511.

H. CONTROL STATIONS

Section H of the hydrographer's report contains adequate discussion of horizontal control and hydrographic positioning.

The positions of horizontal control stations used during hydrographic operations are published and field values based on NAD 83. The geographic positions of all survey data are based on NAD 83. The smooth sheet is annotated with an NAD 27 adjustment tick based on values determined with the NGS program NADCON. Geographic positions based on NAD 27 may be plotted on the smooth sheet utilizing the NAD 83 projection by applying the following corrections:

Latitude:	-2.259 seconds	(-69.918 meters)
Longitude:	6.912 seconds	(106.286 meters)

The prior survey work in common with the present survey is plotted on Valdez datum. According to the Hydrographic Letter Instructions, to convert from the Valdez datum to NAD 83, the user must apply +8.28 seconds to the latitude and –21.12 seconds to the longitude.

I. HYDROGRAPHIC POSITION CONTROL

Differential GPS (DGPS) was used to control this survey. A horizontal dilution of precision (HDOP) not to exceed 3.8 for 1:10,000 was computed for survey operations. NAD 83 is used as the horizontal datum for plotting and position computations.

During shallow water multibeam (SWMB) data gathering, satellite configuration as indicated by HDOP and the number of satellites, is monitored visually on HYPACK. The final positions are provided by the POS/MV that combines the DGPS position with inertial navigation information. In the event that the differential GPS corrector signal is lost, the POS/MV will continue to provide positions based on inertial navigation. Data was analyzed during processing to ensure it contained no significant errors.

DGPS performance checks were conducted in the field and found adequate. Additional information concerning specific control system type, calibrations and system checks can be found in the hydrographer's report and in the separates related to horizontal position control and corrections to position data.

J. SHORELINE

Shoreline map T-12711, T-12714 and T-12715 were compiled on NAD 27 and applied to this survey. Shoreline drawn on the smooth sheet in black originates from the above digital data as provided by the Coastal Mapping Program. The shoreline data and the hydrographic data were merged in MicroStation during the compilation of the smooth sheet.

There were no MHW revisions delineated during this survey. The shoreline maps and the results of the fieldwork as portrayed on the smooth sheet should supersede charted shoreline.

K. CROSSLINES

Crosslines are adequately discussed in the hydrographer's report.

L. JUNCTIONS

Survey H-10919 junctions with the following surveys.

Survey	Year	Scale	Area
H-10918	1999	1:10,000	North
H-10922	1999	1:10,000	West

The junctions with surveys H-10918 and H10922 are complete and a "Joins" note has been added to the smooth sheet where applicable. Soundings and depth curves are in good agreement, typically within 0.1 to 0.2 fathoms. A few soundings from the junctional surveys have been transferred within the common areas to better delineate the bottom configuration and to support depth curves common to both surveys.

M. COMPARISON WITH PRIOR SURVEYS

The following prior survey falls within the common area of the present survey and has been compared with during office processing.

Survey	Year	Scale	Datum
H-5427	1933	1:20,000	Valdez

Prior survey H-5427 covers the entire area of the present survey. This survey was conducted using early single beam echo sounders and visual positioning. Comparisons between present survey and H-5427 were made using a digital copy with the registration and legibility being fair to marginal. Generally, present survey depths are 1-3 fathoms shoaler than prior soundings. A more thorough coverage of the area utilizing the shallow water multibeam system has revealed numerous shoal areas not detected during the earlier surveys. Aside from the effects of past earthquake activity, depth differences may well be attributed to the improvement of positioning and sounding methods.

Charted features originating from this prior survey were in good agreement with the present survey and have been adequately addressed with the exception of a charted rock (16709) located at 60°15'07" N, 147°11'21" W that may originate from H-5427. This feature was not adequately investigated and has been brought forward in red to the smooth sheet. The quality of the prior survey raster image deteriorates in shoal areas making identification of the rock symbology difficult. The transfer of the symbol to the present survey is based on the fact that a rock is currently charted at this location. See additional discussions in this report Section O, Comparison with Chart.

In accordance with the Hydrographic Guideline No. 39, the effect of the 1964 Prince William Sound earthquake were considered in the comparison of this survey. Prince William Sound experienced a bottom uplift of 4-32 feet during the 1964 earthquake. However, due to the depths of water and the differences in data acquisition methods, no reasonable adjustment value for prior soundings could be determined.

Additional information can be found in the hydrographer's report section L.

Survey H-10919 is adequate to supersede the prior surveys within the common area except as noted above.

N. ITEM INVESTIGATIONS

There were two AWOIS items assigned for investigation within the survey area. These items have been adequately investigated during survey operations. Refer to the hydrographer's report, section M, for specific item discussion.

O. COMPARISON WITH CHART

Survey H-10919 was compared with the following charts.

Chart	Edition	Date	Scale
16709	21st	June 29, 1996	1:80,000
16701	17th	July 25, 1998	1:81,436

a. Hydrography

Charted hydrography originates with the previously discussed prior survey and has been adequately addressed in section M of the evaluation report and in the hydrographer's report, section N.

The application of this survey to charts of a scale less than 1:40,000 may require the generalization of features such as ledges, and reefs. The recommended charting disposition of specific ledges or reefs is their depiction as isolated rocks. The application of this survey to charts of a scale greater than 1:40,000 may be accomplished without generalization of features. Features from survey H-10919 have been generalized on charts 16701 and 16709 along the high water line where applicable.

Charted shoreline changes were noted during this survey. A few charted rocks were identified in the field as part of the reefs and high point or extension of the newly located ledges.

A rock presently charted on 16709 at 60°15'07" N, 147°11'21" W, which may originate from prior survey H-5427, was retained and depicted in green on the chart drawing. However, this same rock does not appear on chart 16700 or 16701. Therefore, further research beyond the capabilities of is office is recommended to resolve this charting compilation conflict.

The charted caution to mariners transiting the waters adjacent to the 10-fathom curve around Montague and Green Islands should be retained until such time when the entire area is adequately surveyed and the latest information applied to the current editions of charts 16701 and 16709.

Survey H-10919 is adequate to supersede charted hydrography within the common area except as noted above.

b. Dangers To Navigation

Twenty-four dangers to navigation were identified during survey operations. These dangers were reported to the USCG, NIMA, N/CS261, and N/CS34 on November 17, 1999. Eight additional dangers to navigation were found during office processing and reported to the USCG, NIMA and N/CS1 on January 7, 2000. Copies of these reports are attached.

P. ADEQUACY OF SURVEY

Hydrography contained on survey H-10919 is adequate to:

a. Delineate the bottom configuration, determine least depths, and draw the required depth curves;
b. Reveal there are no significant discrepancies or anomalies requiring further investigation; and
c. Show the survey was properly controlled and soundings are correctly plotted.

The hydrographic records and reports received for processing are adequate and conform to the requirements of the Hydrographic Manual, 4th Edition, revised through Change No. 3, the Hydrographic Survey Guidelines, the Field Procedures Manual, April 1998 Edition, and the Specifications and Deliverables 1999.

Q. AIDS TO NAVIGATION

There are no fixed or floating aids to navigation within the survey area. There were no features of landmark value located and/or recommended for charting within the area of this survey.

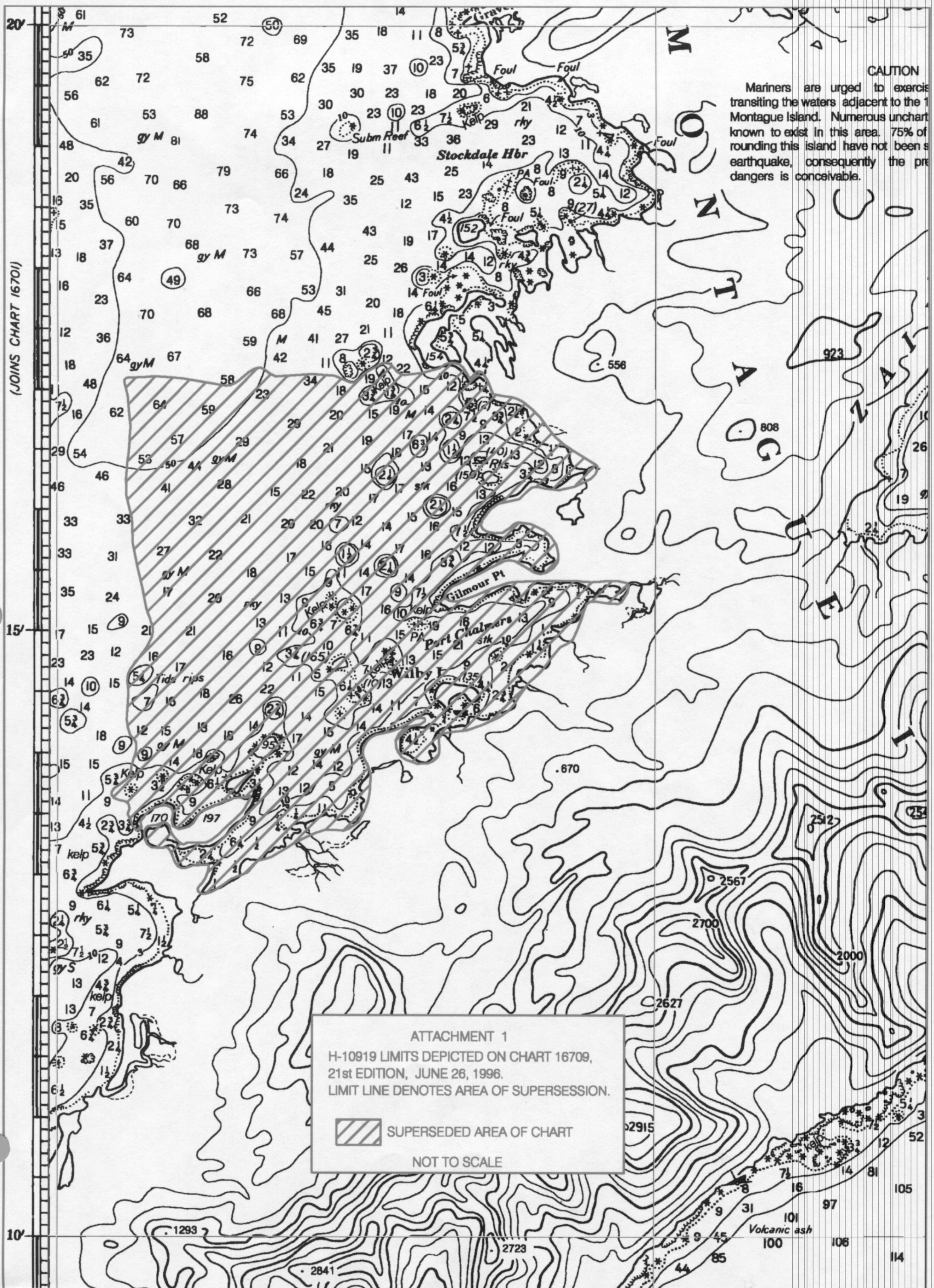
R. STATISTICS
Statistics are adequately itemized in the hydrographer's report.

S. MISCELLANEOUS
Miscellaneous information is adequately discussed in the hydrographer's report. No additional miscellaneous items were noted during office processing.

T. RECOMMENDATIONS
This is a good hydrographic survey. No additional work is recommended.

U. REFERRAL TO REPORTS
Referral to reports is adequately discussed in the hydrographer's report.

Kim Sampadian
Physical Scientist


ATTACHMENT 1
H-10919 LIMITS DEPICTED ON CHART 16709,
21st EDITION, JUNE 26, 1996.
LIMIT LINE DENOTES AREA OF SUPERSESSION.
SUPERSEDED AREA OF CHART
NOT TO SCALE
CAUTION
Mariners are urged to exercis
transiting the waters adjacent to the 1
Montague Island. Numerous unchart
known to exist in this area. 75% of
rounding this island have not been s
earthquake, consequently the pre
dangers is conceivable.
(JOINS CHART 16701)
MONTAGUE
Stockdale Hbr
Gilmour Pt
Port Chalmers
Subm Reef
Tide rips
Volcanic ash
20'
15'
10'

APPROVAL SHEET
H-10919

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, cartographic symbolization, comparison with prior surveys and verification or disproval of charted data. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

Dennis Hill Date: 12-11-01

Dennis Hill
Team Leader
Cartographic Team

I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.

John E. Lowell, Jr. Date: 1/4/02

John E. Lowell, Jr.
Commander, NOAA
Chief, Pacific Hydrographic Branch

****

Final Approval

Approved:

Samuel P. de Bow Date: 3/8/2002.

Samuel De Bow, Jr.
Captain, NOAA
Chief, Hydrographic Surveys Division

NOAA FORM 75-96
(10-83)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H10919

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.
1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
16709	5/15/01	K. SAMPADIAN	Full ~~Part Before After~~ Marine Center Approval Signed Via
			Drawing No. FULL APPLICATION OF SOUNDINGS, CURVES,
			AND FEATURES FROM SMOOTHSHEET
16709	3/18/02	J. Sherry	Full ~~Part~~ Before After Marine Center Approval Signed Via
			Drawing No. fully applied through BP 1706601
			TLN
16701	3/13/02	J. Sherry	Full Part Before After Marine Center Approval Signed Via
			Drawing No. fully applied through 16709
			TLN
16700	3/14/02	J. Sherry	Full Part Before After Marine Center Approval Signed Via
			Drawing No. fully applied through 1670
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.